

SAS BULLETIN

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ANALYSIS, ANTIQUITIES AND AUTHENTICATION

Scientific analysis is commonly used in the authentication of unprovenanced archaeological artifacts, but the practice is not without its controversy. Some have argued that authentication of these objects increases their value on the art market and plays a role in the illicit antiquities trade, increasing the looting of objects. Others state that there is no academic value in the study of antiquities that lack context, and therefore they should not be examined. Several of these concerns were brought up during a panel discussion at this year's ISA in Los Angeles resulting in a spirited debate.

In this issue of the *Bulletin*, an opinion piece written by Marc Walton addresses some of the problems that could arise with the use of scientific analysis to authenticate antiquities. Using the recent study of the papyrus known as the "Gospel of Jesus's Wife" as an example (<http://gospelofjesusswife.hds.harvard.edu/>), he discusses how scientific results can be used to provide an alternate history, and authenticity, to ancient objects (including possible forgeries), based on how the results are interpreted.

In addition to the book reviews, conference summaries and upcoming publications and meetings that are in this issue, members will find a report written by Robert J. Stark, 2012 recipient of the SAS Student Research

International Travel Award. Robert used the award to complete his dissertation research which uses human skeletal remains from Isola Sacra and Velia to look at population diversity and migration during the Roman Imperial era.

The next deadline for this award is February 1st, and student members should consider applying! More information on the award and how to apply can be found in the "Announcements" section of this issue or on the SAS website:

<http://www.socarchsci.org/awards1.html>

Vanessa Muros, Editor

THE PITFALLS OF USING SCIENCE TO AUTHENTICATE ARCHAEOLOGICAL ARTIFACTS

Marc Walton

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A recent volume of the Harvard Theological Review was dedicated to a small piece of papyrus that has become known as the Gospel of Jesus's Wife (King, 2014). A first attempt to publish this object in 2012 was met with controversy over its authenticity (Goodstein, 2012), specifically of its ancient Coptic writing that when translated into English states:

"Jesus said to them, 'My wife...'"

The content of this writing is indeed compelling and has raised the eyebrows of theologians and biblical archaeologists (Depuydt, 2014) alike. However, it is the way that scientific analysis was used to authenticate this object that underscores many longstanding issues about the appropriate use of science to characterize ancient objects stripped of their original contexts either through looting, excavation in an un-systematic manner one or two centuries ago, or outright forgeries intentionally produced to deceive and alter the archaeological record for ideological purposes. Many archaeological scientists have deliberately decided not to authenticate these

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orphaned objects (Inskip, 1992) because analysis can lead to their commodification and higher valuation as they enter into the art market thereby providing a monetary incentive for continued looting of archaeological sites. Another little discussed side effect of analysis is that it can provide a false legitimacy for forged works, otherwise known as laundering. This is likely the case for the Gospel of Jesus' Wife (henceforth GJW).

As reported recently in several news outlets, most notably the *New York Times* (Goodstein, 2014), the GJW was

“...More Likely Ancient Than Fake, Scientists Say”

The published scientific data for the GJW (Yardley and Hagadorn, 2014, Azzarelli et al., 2014, Hodgins, 2014, Tuross, 2014) provides no specific evidence that proves such a headline. In fact, the scientific analysis of the GJW offered little new data to move the debate forward on the authenticity of this object and may have instead confused and obfuscated its true nature—one of the primary dangers of undertaking analysis on a work like the GJW. Even more problematic, as reported the science seems to have been purposely marshaled to present the object as an authentic document instead of allowing the data to objectively stand on its own merits.

The Evidence

The Coptic writing on the GJW was made with lamp-black, a simple ink made from burning organic material (Eastaugh et al., 2008). Modern commercial lamp-black pigments (tube paints) are composed of soot from the burning coke and coal, whereas their counterparts from the 4th-8th centuries AD would have been derived from soot made by burning animal and plant-based fuels such as fat, olive oil, or resin. It is possible to differentiate between lamp-blacks made of mineral (coal) or organic (plant/animal fuels) using the spectroscopic techniques of Raman and FTIR (Coccatto et al., 2014) as was done by the investigators of the GJW at Columbia University and MIT. The Columbia University spectroscopists concluded that the presence of organic lamp-black was consistent with other ancient objects to which they compared the GJW papyrus and was thus of an ancient date (Yardley and Hagadorn, 2014). However, it is equally within the realm of possibility that even a not-so-sophisticated forger would forego using modern off-the-shelf tube paints and instead replicate lamp-black by the pyrolysis of animals, plants, or resins that would be indistinguishable from the ancient black pigment. For instance, one could easily imagine filling a small ceramic pot with olive oil and heating it until it produced a charred black residue. Mix this residue with water as well

as a gum Arabic binder, and black ink is produced with identical material characteristics to the ancient pigment.

The analysis of the papyrus by accelerator mass-spectrometry conducted at the University of Arizona (Hodgins, 2014) and at Woods Hole Oceanographic Institute (Tuross, 2014), clearly indicates that the papyrus substrate was old, dating specifically to the 8th century AD (not 4th as originally presented in 2012). However, what might not have been taken into account, is that there is a long tradition of forging documents and drawings using actual historic paper as a starting point as was so persuasively chronicled by Eric Hebborn in *The Art Forgers Handbook* (Hebborn, 1997). Again, it is not a stretch to think that a potential forger would have been able to obtain a small 4 cm by 8 cm portion of ancient Egyptian papyrus to create the GJW (Depuydt, 2014). A recent search on the auction site eBay for “ancient papyrus” revealed one potential source for this material (fig. 1).

Based on this alternative interpretation of the data, it is clear that it is all too easy to create a faked or forged object that challenges the assumptions and critical powers of even the most erudite scholars and scientists.



Figure 1: Screen Shot of an Ebay sale of a purportedly ancient scroll of papyrus from Egypt. Recovered from auction site on June 1st 2014: <http://www.ebay.com/itm/Ancient-Egyptian-Papyrus-Scroll-Late-Ptolemaic-Period-664-30-BC-/161293083316>

Data Interpretation

Careful scholarship raises questions about why Karen King, a prominent Harvard theologian who was the lead investigator of the GJW, would not have considered this alternative reading of the data. I believe the answer may lie in the scholarly practice of connoisseurship combined with a limited understanding of what scientific analysis can achieve.

Connoisseurship, or the critical judgment of an object based on its aesthetic attributes, remains the most common way to authenticate archaeological objects (Neer, 2005). The connoisseur who studies the characteristics of line, shape, and form as they comprise an artifact or writing, stores a mental database often so vast as to include details of thousands of objects. These databases can be astonishingly accurate. The most respected connoisseurs have honed their critical eyes to such an extent that they can comfortably stake their careers on the ability to spot the authentic object. However, a connoisseur's mental database acquired from a lifetime of looking is ultimately un-sharable. One must simply trust their opinions.

Recognizing a diamond in the rough, as the GJW purportedly is, can accrue enormous prestige to any connoisseur. However, if ultimately it turns out that the object is not genuine, it could seriously damage an academic reputation. After Dr. King's initial connoisseurship approach failed to convince the world of the GJW's authenticity in 2012, it is possible that she sought to rehabilitate her reputation by throwing what was believed to be the objective truth of science at the GJW. The only problem with this approach is that while scientific data are inherently objective, their interpretation is almost always subjective.

As a case in point, almost three decades ago, the J. Paul Getty Museum in Los Angeles purchased a purportedly archaic Greek Kouros sculpture that created a stir similar to the GJW. The events surrounding its acquisition were brought into popular culture by Malcolm Gladwell in his book *Blink: The Power of Thinking Without Thinking* (Gladwell, 2007). A camp of archaeologists and art historians pointed out stylistic inconsistencies between the Getty Kouros and comparable sculptures, notably the Anavyssos Youth in Athens that came from a controlled archaeological excavation. So they turned to scientific analysis which was unable to furnish evidence that was proof-positive for the Getty Kouros's authenticity (Preusser, 1993). Yet depending on which side of the argument you stood, science could be used to bolster your position. It is for this reason that, to this day, the Getty's label for the Kouros states: "Greek, about 530 BC or modern forgery".

Even Dr. Marion True the Getty's curator of antiquities at that time acknowledged, "everything about the Kouros is problematic... I always considered scientific opinion more objective than esthetic judgments. Now I realize I was wrong." (Kimmelman, 1991)

Dr. True's revelation that the interpretation of scientific data can be subjective is at the heart of this discussion of the role science plays in authentication. In scientific disciplines outside the analysis of cultural objects, the subjectivity of interpretation is greatly diminished by the ability to confirm a measurement by repeating it numerous times, with different analytical techniques, and by more than one scientific group. However, in archaeology there are often greater limitations on analysis: an individual object is often the unique example (like the GJW), and more often than not it is not possible to take a sample of the object. Moreover, the analyst typically has limited access to the object which means scientific experiments cannot always be repeated and confirmed by other scientists.

Is Scientific Authentication Really Science?

As regards repeatability of the analysis in authentication studies, the distinction between science and connoisseurship may be a false dichotomy. Both the connoisseur and scientist collect data about an object but using different tools. Connoisseurs use their visual acuity and vast mental databases to make judgments about a work of art. Scientists use tools sensitive to different portions of the electromagnetic spectrum and databases on analytical data to make their assessment. Neither approach provides a comprehensive understanding of the object. Neither discipline is infallible in its ultimate conclusions about what is an authentic object. Both disciplines are needed to produce a balanced understanding of the archaeological artifact.

It is therefore particularly problematic when connoisseurs attempt to use science to validate their critical eye rather than allowing the scientific data to stand on their own merits. In the case of the GJW papyrus, the collection of the scientific data was rigorous, but it could be interpreted in many different ways.

What to do with Orphaned Objects

While it may be tempting, and advisable, for many archaeological scientists to take a stand against the analysis of artifacts that are devoid of an archaeological context, it is not always practical. These orphaned objects will persist as cultural artifacts that demand the attention of the scholarly community. There is no question that the study of artifacts to establish authenticity is an important academic exercise since counterfeits only serve to misrepresent the archaeological record, though it may be argued that fakes and forgeries, once they are revealed as such, say something meaningful about the impulses of the creators of these objects as well as the consumers who desire them (Merryman, 1992). The debate here is about how to use our analytical and critical powers to arrive at

the correct answer regarding what these objects are and without triggering negative consequence like the looting of an archaeological site or the trafficking of illicit goods. In the case of the GJW, the scientific analysis was naïve at best and did not move our understanding of this object forward. The scientific analysis instead served as a sleight-of-hand to distract attention from the more vexing problems with its epigraphy which is much more important in contextualizing the historical and social meaning of this object as well as determining its authenticity. Such analysis confuses rather than enlightens and must be avoided at all costs by archaeological scientists if we are to remain credible.

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THE SKELETONS OF ISOLA SACRA AND VELIA

Robert J. Stark, PhD candidate,
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Through the Society for Archaeological Sciences Student Research International Travel Grant I was able to undertake fieldwork towards completing my doctoral degree at the Museo Nazionale Preistorico Etnografico "Luigi Pigorini" in Rome, Italy. At the Museo Pigorini, working under the supervision of Dr. Luca Bondioli, I examined human skeletal remains and collected second molars from the remains of individuals interred at Isola Sacra at Portus, and from Velia, near Naples.

My doctoral research focuses on the use of non-metric traits (NMTs) and isotopes ($\delta^{18}\text{O}$ and $^{87}\text{Sr}/^{86}\text{Sr}$), for looking at issues of population diversity and migration during the Roman Imperial era, ca. 1st-3rd c. C.E. (Dickin 2005; Sharp 2007). Though migration studies of ancient Roman populations have a long history, deeply rooted in textual, epigraphic, and material culture associations, the use of isotopic and skeletal analyses to gauge human movements and relatedness has only more recently become a key method for gauging migration and population interaction in antiquity (Prowse et al. 2007; Bruun 2010; Killgrove 2010).

During my time at the Pigorini, I documented heritable minor skeletal anomalies, known as nonmetric traits (NMTs), (e.g. joint surface anomalies), which entailed the recording of cranial, dental and infracranial skeletal traits. These traits have a degree of heritability that can be used to look at population similarity and diversity. In tandem with NMTs I obtained permanent second molars (M2) to be used in isotopic testing of oxygen ($\delta^{18}\text{O}$) and strontium ($^{87}\text{Sr}/^{86}\text{Sr}$), two isotopes that systematically vary globally and can aid in providing an indication of the geographic regions in which the individuals in question resided and

migrated from. Dental enamel samples from the permanent second molars (M2) collected were processed following the protocols established in Prowse et al. (2007) ($\delta^{18}\text{O}$) and Evans et al. (2006), ($^{87}\text{Sr}/^{86}\text{Sr}$). Approximately 100 mg. of enamel (~20 mg for $\delta^{18}\text{O}$ and ~80 mg. for $^{87}\text{Sr}/^{86}\text{Sr}$) was removed from each molar included in this study using a handheld dental drill. Following enamel collection, these samples were chemically processed and run using a thermal ionization mass spectrometer (TIMS) for $^{87}\text{Sr}/^{86}\text{Sr}$, and a VG Optima (Isocarb) IRMS for $\delta^{18}\text{O}$, in the School of Geography and Earth Sciences at McMaster University.

The information gathered through these two methods (NMTs and isotopic analyses) will help to address a series of bioarchaeological questions. The isotopic data gathered will help to elucidate possible regional origins and points of migration into and within the Roman Empire. Inclusion of non-metric traits will help to provide a basis for looking at group variability (biodistance) for the regional samples represented in this study (Saunders and Rainey 2008). Both male and female skeletal remains were examined in my research. The inclusion of both male and female skeletal remains, though seemingly mundane, is of importance as it will help to provide increasing insight to who migrated in the past and at what age, an issue that remains an ongoing debate in larger classical archaeological discussions (cf. Bruun 2010).

The assistance provided by the Society for Archaeological Sciences Student Research International Travel Grant has helped me to develop as a researcher by giving me the great opportunity to conduct foreign research as part of my doctoral program. I hope to use the skills and methodologies I have learned through this experience to further develop upon my present research in the coming years.

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ANNOUNCEMENTS

Call for nominations-SAS President-elect

Nominations are now being accepted for the office of President-elect. The President-elect will serve a 2 year term (2015-2017). Following this term, he/she will then serve another 2 years as SAS President. The term for President-elect begins in April (at the SAA meeting) when current President-elect, Marc Walton, takes over the office of President.

SAS members who are interested in the position should email a letter of intent and a short CV to current President Robert Tykot (rtykot@usf.edu) by Feb. 1, 2015. Elections will be held in March.

SAS Student Research International Travel Award

The SAS Board would like to encourage student members to apply to the Student Research International Travel Award. Up to \$1000 is available to help with the costs of international travel for laboratory or field research to students who have been SAS members for more than one consecutive year. Applications will be accepted from undergraduates in their final year of study who are planning to attend graduate school, as well as Masters degree and PhD students. Research must be undertaken in a different country than that of their home institution. Funds may not be used to attend at conferences, field schools, classes and/or training courses.

The next application deadline is **February 1, 2015**.

Those who are interesting in applying can find more information here:

<http://www.socarchsci.org/Student%20Research%20Award.pdf>

Malcolm H. Wiener Laboratory for Archaeological Sciences Announces New Funding Opportunities

The Malcolm H. Wiener Laboratory for Archaeological Science of the American School for Classical Studies in Athens has recently made significant changes to its fellowship program. Three different types of Fellowship funding are offered Post-Doctoral (3 year), Pre-Doctoral (2 year term), and Senior (5-10 months), as well as shorter duration, more focused Research Associate positions. Applicants are welcome from any college or university worldwide.

Priority will be given to question-driven research projects that address substantive problems through the application of interdisciplinary methods in the archaeological sciences. Laboratory facilities are especially well equipped to support the study of human skeletal biology, archaeobiological remains (faunal and botanical), environmental studies, and geoarchaeology (particularly studies in human-landscape interactions and the study of site formation processes). Research projects utilizing other archaeological scientific approaches are also eligible for consideration, depending on the strength of the questions asked and the suitability of the plan for access to other equipment or resources not available on site.

Post-Doctoral Fellowship

- Next competition announced fall of 2016 for the 2017-2018 academic year
- Three (3) year term
- Eligibility limited to individuals who have received their PhD within the last seven (7) years.
- Stipend: \$35,000 per annum

Pre-Doctoral Fellowship

- Current competition begins in fall of 2014 for the 2015-2016 academic year (January 15 deadline for applications)
- Two (2) year term
- Eligibility limited to individuals actively enrolled in a graduate program who have passed all qualifying exams and have an approved PhD proposal.
- Stipend: \$20,000 per annum

Senior Fellowship

- Current competition begins in fall of 2014 for the 2015-2016 academic year (January 15 deadline for applications)
- 5 to 10 month terms
- Eligibility limited to individuals who received their PhDs at least five (5) years previous to application

- Stipend: \$15,000 for a 5 month term, \$30,000 for a 10 month term

Research Associate

- Current competition begins in fall of 2014 for the 2015-2016 academic year (January 15 deadline for applications)
- Term variable, up to 9 months

For more information and instructions on how to apply:

<http://www.ascsa.edu.gr/index.php/wiener-laboratory/wlfellowships>

Upcoming Conferences/Call for Papers Seventh MaSC Workshop and Meeting

The Art Institute of Chicago, Northwestern University, the Field Museum, and Agilent Technologies
Chicago, USA
17-22 May 2015

The 7th Workshop and Meeting of the Users' Group for Mass Spectrometry and Chromatography (MaSC) will take place in Chicago from Sunday 17th – Friday 22nd May 2015. The workshop, hosted jointly by the Art Institute of Chicago, Northwestern University, the Field Museum, and Agilent Technologies, will take place on 17-20 May. The meeting will be held at the Art Institute of Chicago on 21-22 May.

Workshop, 17-20 May 2015

The theme of the workshop will be applications of inorganic and isotope ratio (IR) MS techniques for the study of art and archaeology. It will provide a unique and valuable opportunity for participants to compare and assess the relative advantages of several MS techniques – ICP-MS, LA-ICP-MS and related IR-MS methods – for the characterization of diverse materials including metals, glass, ceramics, minerals and pigments. IR-MS analysis of organic materials will not be the focus of the workshop but applications will be discussed.

The Workshop will begin with a welcome/orientation session the afternoon of 17 May at the Art Institute of Chicago. Practical workshop sessions, including lectures, demonstrations and hands-on training, will take place on 18-20 May at Northwestern University, the Field Museum and Agilent Technologies (the Northwestern and Agilent laboratories are a short drive from downtown Chicago; transportation between workshop locations will be arranged). Workshop instructors include Marc Walton and Monica Ganio (Northwestern), Laure Dussubieux and Mark Golitko (Field Museum), Patrick Degryse (Leuven University), Andrew Shortland (Cranfield University), and Jon Talbott (Agilent Technologies).

The workshop will be limited to 15 participants. Those wishing to attend are requested to submit a short paragraph describing their experience with mass spectrometry and how they would benefit from the workshop, which should be included in the registration form (see below) and sent to MASC2015AIC@artic.edu before 15 December 2014.

The registration fee for the workshop is USD 350.

Meeting, 21-22 May 2015

The meeting will be held at the Art Institute of Chicago and will comprise discussions and presentations on novel applications of chromatographic and mass spectrometric techniques to the study of art and cultural artefacts. The meeting will include a session on inorganic and isotope ratio MS, but contributions on a broad range of topics are encouraged. We hope to create an informal atmosphere for the exchange of ideas, and so discussions of work in progress are welcomed. A reception will be held at the Art Institute the evening of Thursday 21st May.

Those interested in presenting a paper or poster should submit an abstract of up to 200 words to MASC2015AIC@artic.edu before 15 December 2014.

The registration fee for the meeting is USD 150 for those who register before 15 February 2015, or USD 200 after this deadline. The registration fee for students is USD 75.

Details of the workshop and meeting and a registration form can be found on the MaSC website, www.mascgroup.org. Questions can be addressed to the local organizers and MaSC committee, c/o Ken Sutherland and Marc Walton, at MASC2015AIC@artic.edu.

ARCHAEOLOGICAL CERAMICS

Charles C. Kolb, Associate Editor

This issue contains four topics: 1) Book Reviews on Ceramics; 2) Informational Item; 3) Previous Professional Meetings; and 4) Forthcoming Professional Meetings. The programs for the following meetings have not yet been posted; contributions on ceramics will be summarized in the next issue of the *Bulletin*: Society for Historical Archaeology, Seattle, WA USA, 6-11 January 2015; Archaeological Institute of America, New Orleans, LA USA, 8-11 January 2015; and Society for American Archaeology, San Francisco, CA USA, 15-19 April 2015.

Book Reviews on Ceramics

Oceans Odyssey 4: Pottery from the Tortugas Shipwreck, Straits of Florida: A Merchant Vessel from Spain's 1622 Tierra Firme Fleet. Greg Stemm, Sean Kingsley, and Ellen Gerth (eds.), Oxford and Philadelphia: Oxbow Books, 2014. xvii + 259 pp., figures, references. ISBN-10: 1782977104, ISBN-13: 978-1782977100; £27.00, \$39.72 US (hardcover), digital edition ISBN 978-1-78297-711-7; \$45.00 at Odyssey Marine Exploration's Shipwreck Store where the first three reports of the series are also available:

<http://shipwreckstore.com/cart/products/Oceans-Odyssey-4.html>

Greg Stemm is the co-founder and Chief Executive Officer of Odyssey Marine Exploration, Inc., a pioneer in the exploration and archaeological excavation of deep-ocean shipwrecks. His biography: <http://www.shipwreck.net/gps-bio.php>. Archaeologist Sean Kingsley, Director of Wreck Watch International (London), has 25 years of experience working in marine archaeology, specializing in the recording and interpretation of shipwrecks, harbors, and pottery and trade patterns. He holds a doctorate from Oxford University, and is a former visiting research fellow of Reading University. See:

<https://independent.academia.edu/SeanKingsley>. Ellen Gerth, a graduate of Bowdoin College, has been Curator of Collections and Manager of Content Development at Odyssey Marine Exploration since 2004 and formerly was an editor at Time-Life Books. Ocean Odyssey has, to date, published four hardcover volumes dealing with shipwrecks and their artifacts. The first two are not relevant to this review: *Oceans Odyssey: Deep-Sea Shipwrecks in the English Channel, Straits of Gibraltar & Atlantic Ocean*, edited by Greg Stemm and Sean Kingsley (Oxford: Oxbow Books, 2010) and *Oceans Odyssey 2: Undersea Heritage Management & Deep-Sea Shipwrecks in the English Channel & Atlantic Ocean*, edited by Greg Stemm and Sean Kingsley (Oxford: Oxbow Books, 2011).

Oceans Odyssey 3: The Deep-Sea Tortugas Shipwreck, Straits of Florida: A Merchant Vessel from Spain's 1622 Tierra Firme Fleet, edited by Sean A. Kingsley and Greg Stemm, is a product of Odyssey's ongoing commitment to share archaeological work with the public. From June 1990 through October 1991, Seahawk Deep Ocean Technology of Tampa, Florida, commenced the world's first robotic archaeological excavation of a deep-sea shipwreck south of the Tortugas Islands in the Straits of Florida. At an average depth of 405 meters (range 394.5-406.4 m), 16,903 artifacts were recovered using a Remotely-Operated Vehicle (ROV). The wreck

has been interpreted as the *Buen Jesús y Nuestra Señora del Rosario*, a small (117-ton) Portuguese-built and Spanish-operated merchant vessel from the 1622 Tierra Firme fleet which was returning to Seville from Venezuela's Pearl Coast when lost in a hurricane after leaving Havana on 5 September 1622. After 1,489 hours of robotic diving and 20 years of research, the results of the world's first ever deep-sea excavation are reported in the publication of *Oceans Odyssey 3: The Deep-Sea Tortugas Shipwreck, Straits of Florida: A Merchant Vessel from Spain's 1622 Tierra Firme Fleet* (Oxford: Oxbow Books, 2013). *Oceans Odyssey 3* introduces the shipwreck and its artifact collection which is now owned and curated by Odyssey Marine Exploration. The collection ranges from gold bars to silver coins, pearls, ceramics, beads, glass wares, astrolabes, tortoiseshell, animal bones and seeds. The Tortugas shipwreck reflects the daily life of trade with the Americas at the end of the Golden Age of Spain and presents the capabilities of deep-sea robotics as tools for precision archaeological excavation. Some of the results have been published in an online report: Greg Stemm, Ellen Gerth, Jenette Flow, Claudio Lozano Guerra-Librero & Sean Kingsley, *Odyssey Papers 26, The Deep-Sea Tortugas Shipwreck, Florida: A Spanish-Operated Navio of the 1622 Tierra Firme Fleet. Part 1, the Site* (2013), 35 pp: https://www.academia.edu/3597393/Greg_Stemm_Ellen_Gerth_Jenette_Flow_Claudio_Lozano_Guerra-Librero_and_Sean_Kingsley_The_Deep-Sea_Tortugas_Shipwreck_Florida_A_Spanish-Operated_Navio_of_the_1622_Tierra_Firme_Fleet_Part_1_the_Site See also Sean Kingsley, Ellen Gerth, and Michael Hughes "Ceramics from the Tortugas shipwreck: A Spanish-operated *Navio* of the 1622 Terra Firme fleet," pp. 77-96.: <http://www.shipwreck.net/pdf/Kinglsey.pdf> .

The same hurricane also claimed the galleon *Nuestra Señora de Atocha* ("Our Lady of Atocha"), the most famous ship of the same 28 ship convoy of Spanish ships carrying copper, silver, gold, tobacco, gems, jewels, jewelry, and indigo from Spanish ports at Cartagena and Porto Bello in New Granada (current Colombia and Panama, respectively) to Spain.

The sequel to *Oceans Odyssey 3*, *Oceans Odyssey 4* further highlights the archaeological work completed during the 1990-1991 excavation of the "Tortugas" shipwreck *Buen Jesús y Nuestra Señora del Rosario*. *Oceans Odyssey 4* focuses on the ship's pottery assemblage comprised of a major collection of olive jars, tablewares, cooking vessels and tobacco pipes recovered from the wreck site. The assorted ceramics presented in the volume's seven chapters embrace the unchanged

cultural preferences and production that dominated early 17th-century Spain. Additionally, the Afro-Caribbean colonoware suggests possible evidence of maritime slavery in the Americas fleet and the ship's olive jars reveal the economics of long-distance colonial trade. These papers, enhanced by full-color images and detailed charts of recovered artifacts, provide a rare insight into the customs and traditions that flourished during the final years of Spain's Golden Age. The artifacts include a major collection of 3,800 intact and fragmentary olive jars, tablewares, cooking vessels and tobacco pipes. The ship's Seville dominated tablewares provide a revealing index of unchanged cultural tastes and continued production at the end of Spain's Golden Age. For cooking the crew relied on Afro-Caribbean colonoware, possibly the first recorded archaeological evidence of maritime slavery in the Americas fleets. Two tin-glazed plates painted with papal coat of arms – the Keys of Heaven and triple-crown – may have been used by Spain-bound clergymen from the newly formed Sacred Congregation of the Propagation of the Faith. Samples of all ceramic types were subjected to Inductively-Coupled Plasma Spectrometry (ICPS) analysis to determine vessel origins. The monograph's chapters focus on the tablewares, tin-glazed papal plates, Afro-Caribbean cooking wares, the olive jars, Inductively-Coupled Plasma Spectrometry results, and a study of how the pottery reflects Spanish colonial economic models, also compared to Roman and medieval structures. A summary of the contents of the fourth monograph follows; each chapter has its own references (formats vary including or excluding publisher and/or place of publication), nearly all of the 234 figures are in color, and there is no index. The "Preface: Archaeological Ethics in Free and Open Debate"(pp. vii-x, 7 figures) by archaeologist and ceramics expert Ivor Noël Hume, OBE, FSA, provides background on shipwreck archaeology, the excavation of the *SS Republic* (sunk in 1865 off the coast of Georgia, USA), its cargo and artifacts (including glass bottles and umbrella inkstands, Stoneware inkpots, and Ironstone China cups), Odyssey Marine Excavations, and the 2001 UNESCO Convention and 2013 *Manual*. Noël Hume comments that: "I realized that Odyssey in its excavation of the *SS Republic* had complied with all but one of UNESCO's rules, and had done so *before* they were published" (p. x). See also "Ivor Noël Hume" by Charles C. Kolb in *Encyclopedia of Global Archaeology* (Claire Smith, ed.-in-chief); New York: Springer, 2014, pp 5295-5297, http://download.springer.com/static/pdf/957/prt%253A978-1-4419-0465-2%252F8.pdf?auth66=1392930578_ff234e09408ccf36d02946ce6e99769e&ext=.pdf.

The “Introduction: Spanish pots, merchants, & a fading Golden Age” (xi-xvii, 6 figures, 20 references) by Greg Stemm and Sean A. Kingsley provides a review of the ship, its cargo and artifacts, the excavation, and artifact curation. Noël Hume is incorrectly referenced as “Hume” in two chapters (p. 110, 147, 249, 258); the references are to *The Archaeology of Martin's Hundred*, 2 vols., by Ivor Noël Hume and Audrey Noël Hume (Philadelphia: University of Pennsylvania Museum of Archaeology and Anthropology/Williamsburg, VA: Colonial Williamsburg Foundation, 2001) reviewed by me in *The Old Potter's Almanack: Joint Newsletter of the Prehistoric Ceramics Research Group and The Ceramic Petrology Group (British Museum, London)* 9(1):7-9 (March 2002). Careful proofreading should have caught this discrepancy.

Chapter 1: “The Deep-Sea Tortugas Shipwreck, Florida (1622): The Ceramic Tablewares” by Sean A. Kingsley (pp. 1-97, 134 figures, 3 endnotes, 9 tables, 165 references, 1 appendix). Twenty-one primary types of tableware (2,309 tableware and cooking vessel rim sherds, including Afro-Caribbean colonoware [Types 9 and 10, see chapter 4]), 1,477 tin-glazed sherds (8 types identified), 336 lead-glazed ware sherds, and 218 unglazed coarseware specimens were identified. The latter assemblage is similar to the ceramic record of *Nuestra Señora de Atocha*. The ceramic classes, numbers of sherds and vessels, weights (kg), and percentages of total sherds and percentages of total weights are reported along with vessel distributions and types. Distinct vessels, rims, sherds, and Munsell colors are also tabulated. Table 3 (p. 5) provides a useful correlation of “Tortugas types” and English, American, and Spanish terminology. English rather than American terminology was used to classify the tin-glazed specimens. ICPS compositional studies (Chapter 5, this volume) are also summarized and there are comparisons of similar assemblages from terrestrial sites and other maritime contexts: Seville Blue on Blue Ware (four vessel forms: plates, bowls, and jugs are recorded as are 10 rim and 13 base forms; types of decoration are defined; and in situ color photos document contexts); Seville Blue on White Ware (primarily plate and bowl forms, 7 rim and 7 base style and an “eclectic” variety of decorations are documented); Plain White Morisco Ware (four vessel forms, mainly plates and bowls are recorded); Other Seville Wares (Sevilla White plates, bowls, and cups; and Andalusian Polychrome jugs are reported); Other Morisco Wares (Yayal Blue on white jars, pitchers, bowls, and jugs; Santo Domingo Blue on White pitchers; and Santa Elena Mottled Blue on White cups are detailed); Unglazed Coarsewares (10 vessel forms: jars, bowls, and jugs are noted); and Lead-glazed Wares (jug and costrel forms, including 65 intact vessels, are

characterized). The *Buen Jesús* assemblage included 98.4% tin-glazed wares from multiple workshops in or near Seville and there are 16 correlations of these artifacts with those from the *Atocha* wreck assemblage. Kingsley discusses the Seville's Triana suburb which was the center of that city's pottery industry (tin-glazed and coarse earthenwares) and the residences of Seville's seafaring population. Ceramic prices, classes of tablewares, and minimal vessel counts and decorative motifs are documented, and shipwreck tablewares bases on ICPS are summarized (p. 74, Table 9). In Appendix 1: Tableware Catalogue (pp. 84-97, 3 endnotes), he details the types and variants.

Chapter 2: “Papal Plates & Propaganda on the Deep-Sea Tortugas Shipwreck, Florida (1622)” by Sean A. Kingsley (pp. 99-105, 9 figures, 3 endnotes, 19 references). 1,477 unique tin-glazed specimens feature insignia of the papacy: Keys and Morisco Suppression and Papal Arms. Kingsley relates these to the Sacra Congregatio Propaganda Fide of 1622 and missionary work in the Hispanic New World. Chapter 3: “Spanish Olive Jars from the Tortugas Shipwreck, Florida (1622)” by Sean A. Kingsley, Jenette Flow, Ellen Gerth, and Claudio Lozano Guerra-Librero (pp. 107-155, 39 figures, 29 tables, 4 endnotes, 65 references, 1 appendix). 209 olive jars or *botijas* are discerned from 86 intact olive jars, 123 rim sherds, and 1,344 jar sherds (128 color images document vessel and rim forms). Four types are discerned and three (*botijas*) are related to John Goggin's (1960) olive jar study: Middle Styles A, B, and C. The types are characterized as to dimensions, distribution on the wreck, Munsell colors, rim types, vessel capacities, and merchants' marks – pre- and postfired – on jar rims (*not* potters' marks). Type 1 (Goggin's A) was used for wine and vinegar, Type 2 (Goggin's B) held olive oil; Type 3 (Goggin's C) possibly held honey. Type 4, an *oriza* form made in Seville, was kitchen or dining ware used to store foodstuffs on the ship. The authors comment on vessel content mythology, metrology, function and ownership, and correlate the vessels with the ship's itinerary. Appendix 1: Olive Jar Dimensions details every specimen (pp. 149-155).

Chapter 4: “The Deep-Sea Tortugas Shipwreck, Florida (1622): Afro-Caribbean Colonoware & Maritime Slavery” by Ellen Gerth and Sean A. Kingsley (pp. 157-198, 49 figures, 6 endnotes, 113 references), 278 colonoware sherds, but no intact specimens, were recovered and two types characterized: Type 9, A through F subtypes, and Type 10, A to C subtypes. This utilitarian unglazed ceramic was handmade, had dense temper (crushed calcined shell, stone, grit, or sand), low-fired and fabricated as cooking pots and griddles. It is often

recovered from 16th to 20th century New World sites, has multicultural provenance, and typically found in Spanish colonial sites in the Circum-Caribbean region and made by enslaved Afro-Americans rather than Native Americans. Specimens were recovered from two locations on the wreck site. Analysis of the assemblage suggests 18 original vessels, 9 forms, and 11 rim styles. The socioeconomic contexts of the ware are examined from locations in Hispaniola; Cuba, Nueva Cádiz, Venezuela; Panamá La Vieja; Jamaica; the Lesser Antilles, West Indies; and Spanish Florida. The ware is uncommon among shipwreck assemblages and the authors consider African maritime slavery in 1622, concluding that the ceramic was made by a heterogeneous group of historic Afro-Caribbean peoples and provides evidence of African maritime slavery. Hauser's work on colonoware is often cited but Chris Espenshade's is not.

Chapter 5: "Chemical Analysis of Pottery from the Tortugas Shipwreck (1622) by Plasma Spectrometry (ICPS)" by Michael J. Hughes (pp. 199-227, 6 figures, 8 tables, 37 references). A "representative selection" of 57 ceramic specimens was selected for analysis and the sampling strategy discussed (pp. 197, 204-205). The ICPS (= ICP-AES) methodology is covered in four paragraphs; more details in Orton and Hughes (2013:168-182); see also my review of *Pottery in Archaeology*, 2nded. (Clive Orton and Michael Hughes; Cambridge Manuals in Archaeology, Cambridge: Cambridge University Press, 2013), *SAS Bulletin* 37(1):7-9 (Spring 2014)<http://www.socarchsci.org/bulletin/SAS3701.pdf> and "Provenance Studies in Archaeology" [Ceramics, Lithics/Stone, Metals, Glass, Textiles] in *Encyclopedia of Global Archaeology* (Claire Smith, ed.-in-chief), New York: Springer, 2014, pp. 6172-6181 http://link.springer.com/referenceworkentry/10.1007/978-1-4419-0465-2_327.

Sherds and vessels sampled are identified and pictured (illustrations have a constant-size scale), and Hughes also discusses the clay sources in the Triana area of Seville. The results of his analysis of the *Buen Jesús* specimens and clay specimens from the presumed production sites employ Principal Components Analysis and Discriminant Analysis. Nine chemical types are discerned including a Main Seville Chemical Group and other production loci west of Seville with high Mg clays. He confirms that Type 1 olive jars were made near Cordoba and Types 2 and 4 from near Seville, and that two of four colonoware specimens may be from the Valley of Mexico. He also compares his results with three other studies: Olin et al. (*Archaeological Chemistry II*, pp. 200-229, 1978), Iñañez et al. (*JAS* 35:425-440, 2008), and Polvorinos del Rio and Castaing (*Archaeometry* 52(1):83-98, 2009). There were

ca. 30 Seville workshops and the potters blended or mixed clays, shifting from white- and red-firing clays over time. The manganese-bearing clays come from sources 18-24 km from Seville.

Chapter 6: "Clay Tobacco Pipes from the Tortugas Shipwreck, Florida (1622)" by J. Byron Sudbury and Ellen Gerth (pp. 229-243, 13 figures, 2 tables, 6 endnotes, 55 references). Sudbury is a highly regarded expert on clay pipes. There is a brief overview of the early tobacco industry in the New World and a discussion of early smoking and clay pipes beginning ca, 2000 BCE. The *Atocha* wreck yielded one red clay pipe bowl while the *Buen Jesús* provided 7 clay tobacco pipe stem fragments (6 earthenware and 1 white clay). Metrics and colors of the specimens are provided and there are exterior, internal, and end views as well as photomicrographs. The earthenware specimens were made by New World indigenous pipemakers while the white clay pipe fragment has an Anglo-European provenance. The authors conclude that the pipe were the personal effects of the crew and/or passengers.

The last contribution, Chapter 7: "Rome in Spain, Spain in the Americas: Amphoras, Olive Jars & the Economics of Long-Distance Trade" by Sean A. Kingsley, Michael Decker and Ellen Gerth (pp. 245-259, 10 figures, 106 references), focuses on Andalusian Spain and the production of Roman Dressel 20 amphora and colonial Spanish olive jars along the banks of the Guadalquivir River Valley between Seville and Cordoba, and area with 56 identifiable kilns. Production parameters, makers' stamps, vessel contents, and distribution and consumption during the Roman period are reported. Notably 80% of 24,750,000 amphorae at Monte Testaccio in Rome are Dressel 20 vessels from the Seville region. Sixty-one maritime locations on the Mediterranean Sea or at Atlantic Cádiz also have Dressel 20 amphorae. Consumer demands and amphora use by Roman Legions are compared to the demographics and production in 16th century Seville.

This excellent monograph has been 20 years in the making and the result is worth the wait. The authors and production staff must be congratulated for producing this detailed documentation of the excavation and ceramic artifacts, as well as the meticulous and detailed analysis of the ceramics, and economic, political, and sociocultural interpretations grounded on historical sources. The illustrations are fabulous and have appropriate metric scales but no grayscale or color bars to measure fidelity. Nonetheless, this volume sets a high standard for other marine archaeological publications and for terrestrial archaeological studies as well.

Mesopotamian Pottery: A Guide to the Babylonian Tradition in the Second Millennium B.C., James A. Armstrong and Hermann Gasche, with contributions by Steven W. Cole, Abraham van As, and Loe Jacobs, 2014, Mesopotamian History and Environment, Series II, Memoirs IV. Ghent and Chicago: A Joint Publication of the University of Ghent and the Oriental Institute of the University of Chicago. xix + 102 pp., 48 figures, 136 plates, 9 tables. ISBN 978-940032-18-1 (CH), ISBN 978-1-61491-018-3 (USA). \$180.00 (hardcover) and online gratis, <http://oi.uchicago.edu/research/publications/misc/mesopotamian-pottery>.

Archaeologists Gasche (University of Ghent) and Armstrong (the Oriental Institute of the University of Chicago), with the collaboration of other excavators in southern Iraq and surrounding regions, have prepared this comprehensive guide to the Babylonian pottery of the second millennium BCE. Their goal was to produce a guide to the pottery shapes of Babylonia in this millennium that would be useful for archaeologists who work with ceramics from excavations and surveys. The focus of the monograph is on more recent excavations, where the pottery has been stratigraphically excavated and well recorded. In this compendium, the vessels are presented in groups based on shape, and the pottery groups are laid out both chronologically and geographically, so that developments over time and regional distinctions become readily apparent. Accompanying distribution maps show where each ceramic group is located and synoptic tables permit the reader to locate groups. There are detailed discussions of the forms and their geographical distribution, as well as a treatment of the historical implications of the evidence. In addition, there is a valuable set of references but no list of tables or illustrations (in the main 136) plates, nor is there an index.

The monograph is composed of nine sections, beginning with the “Bibliography” of 490 entries (pp. ix-xviii), “Acknowledgments” (p. xix), and an “Introduction” (pp. 1-2) in which earlier efforts by the Working Group on Mesopotamian Pottery (established in 1985) are related to the current study, plus a general discussion of the materials used in this study. The fourth component, “Chronology Revisited” by Steven W. Cole (pp. 3-6), provides a review of recent chronological debates from the perspective of a cuneiformist. He considers textual evidence, current dates and notable gaps in the sequences, calendric calculations, and eponymic sequences. “Key Stratigraphic Sequences” (pp. 7-12) provides salient background on excavations, collections, and sites and is organized into five parts: 1) Northern Alluvial Plain (2

sites: Tell ed-Dēr and Tell ed-Deylam); 2) Southern Alluvial Plain (5 sites: Umm al-Hafriyat, Nippur, Isan Bahriyāt, Sinkara, and Al-Hiba); 3) Middle Euphrates (1 site: Khirbet ed-Diniye); 4) Diyala Basin (2 sites: Tell Yelkji and Tell Kesaran); and Susiana (1 site: Susa).

“Description of Pottery Groups” (pp. 13-73). By way of introduction, Armstrong and Gasche point out that the materials covered include vessels that occur in some frequency, plus rarer shapes because of their diagnostic character or intrinsic interest. Miscellaneous objects such as stands, lids, strainers, etc. are not detailed in the monograph. Vessels are arranged in groups based on shape that, in turn, are organized into families; groups belonging to the same family have similar shapes. “The family identification number is a multiple of 5. Family designations, therefore, look like Family 5, Family 10 and so on. Our use of multiples of 5 is primarily for ease of reference and to remembering family designations, should that prove to be desirable” (p. 13). The authors further explain the arrangement of shapes, the layout of groups on the plates, whole profiles and sherds, rim diameter measurements, manufacturing techniques (referencing the van As and Jacobs discussion appearing later in the volume), accompanying maps that illustrate the geographical distribution of each group on the plates, and eight synoptic tables that present all the groups of pottery according to shape. Next, 56 families of shapes are defined. Groups belonging to each family are described in detail and followed by a discussion of geographical distribution, *comparanda*, and references to the plates and tables. Vessel profiles infrequently accompany some descriptions and there is one photograph; the plates have copious illustrations and other data as well as the distributional maps. As an example, Family 5 includes low and wide open vessels (platters) and includes Groups 5 A₁, 5 B₁, 5 C₁, 5 C₂, 5 D₁, 5 D₂, 5 E₁, and 5 E₂.

“The Babylonian Potter: Environment, Clay and Techniques” by Abraham van As and Loe Jacobs (pp. 75-93). The two University of Leiden ceramic specialists present what is called a “comprehensive study” of the potters and production methods during the periods from Ur III through Isin II. They comment that for this millennium there is minimal textual evidence and little direct evidence of workshops and kilns. Van As and Jacobs rely on vessel replication using local clays and data from ethnographic observations (ceramic ethnoarchaeology) from 1985 and 1986 at Al Thawra, a village of potters located near Baghdad (12 monochrome pictures accompany this discussion). The raw materials used by potters included alluvial secondary calcareous montmorillonite clay that is not very plastic but had natural inclusions so that no temper was added. They

discuss the production sequence: clay sourcing and the preparation of the clay body, shaping techniques, (open and closed forms and decoration), drying, and firing techniques (open fires or kilns). Open forms included trays/platters, bowls, and large bowls; closed forms included goblets, cups, large high beakers, jars, and globular jars. Decoration consisted of incision, appliqué, and painting with bitumen. Next the evidence of the raw materials used and pottery technology are documented: hand-forming, wheel-throwing, finishing, decoration, drying, and firing (water smoking was observed and firing temperatures ranged from 755-1000° C). The raw materials and finished products were examined, low-tech fabric analysis (binocular microscopy) for mineral and pore characterization; and high-tech fabric analysis (microprobe at Leiden University and XRF at Free University in Berlin) of sherds and clay samples. Fifty microprobe analyses were conducted on 20 sherds and 19 studies on nine clay samples, while 23 specimens from four sites were analyzed by XRF (minimal data and results are presented pp. 86-87). Vessels were also examined for evidence of throwing spirals, throwing ridges, self-slips, string-cut bases, coiling, and wheel-throwing from the cone. Finishing marks included scraping, rim finishing, and bitumen painting. The forms, functions, and manufacturing techniques related to a discussion of folk vs. devised classifications. The authors quote Frederick R. Matson (*Ceramics and Man* 1965:202): “Unless ceramic studies lead to a better understanding of the cultural context in which the objects were made and used, they form a sterile record of limited worth.” In their “Summary and conclusions,” van As and Jacobs point out that second millennium BCE Babylonian pottery was a quickly produced, standardized, and hand- and wheel-made consumer product, and that there were no major manufacturing changes during this millennium. They also conclude that there were very few pottery classes or types during this long period and also surmise that crude oil might have been a fuel for the Babylonian kilns.

“Final Remarks” (pp. 95-102). Armstrong and Gasche provide some new dates for previously published material and, in other instances, propose alternative dates based on *comparanda*. They also offer a very valuable but brief survey of the Babylonian ceramic tradition in the 2nd millennium for each chronological unit: 20th century (Ur III period), 19th and 18th centuries Isin-Larsa period, 17th century (Era of Hammurabi and Samsuiluna or Old Babylonian period), 16th century (Late Old Babylonian period), 15th and 14th centuries (Early Kassite period), 13th through 11th centuries (Late Kassite and Isin II periods). Their remarks summarize regional differences, manufacturing techniques, and changes in decoration. In

conclusion, they demonstrate that there is a continuous Babylonian ceramic tradition for the second millennium BCE and the geographic distribution of Babylonian ceramics in the heartland and periphery illustrate the expansion and contraction of Babylonian economic and political power. The bulk for the volume consists of “Plates, Synoptic & Stratigraphic Tables” (pp. 105-385 unnumbered). Legends and abbreviations used in the 136 plates are identified. Each plate includes vessel profile drawings, images of actual vessels, tabulations of sites and provenance, Munsell color designations, and remarks. Lastly, nine color tables illustrate the pottery groups, chronologies, and vessel forms. The monograph is a highly significant work that synthesizes a critical era in Mesopotamia and will, indeed, be useful to scholars working in this region in the second millennium BCE. The value of the proposed typology -- vessels arranged in groups based on shape and, in turn, organized into families -- will be evaluated by actual users in the field.

Informational Item

The Editors of the *Journal of Ancient Egyptian Interconnections* are pleased to announce the publication of *JAIEI* 6:3 which is a special fascicle dedicated to ceramic interconnections. The Table of Contents is available online at:

<https://journals.uair.arizona.edu/index.php/jaei/> Fee for access to the four pdfs. Contributions to *JAIEI* 6:3 include: “Ceramic Bibliography 2010-2014” by Mary Ownby and Bettina Badar; “Greek Imports Unearthed at the Saite-Persian Cemetery at Abusir” by Květa Smoláriková; “Late Bronze Age Imports at Qantir: Petrographic and Contextual Analysis of Fabric Groups” by Mary Ownby, Henning Franzmeier, Sabine Laemmel, and Edgar Pusch; and “Egyptian-Style Pottery Dated to the 13th Century BCE at Hazor, Megiddo and Lachish: Corpus, Ware Fabrics and Typology” by Katia Charbit Nataf.

Previous Professional Meetings

Glazed Ware in the Black Sea and Mediterranean as a Source for the Studies of Byzantine Civilization: Abstract of the International Research Seminar, Leonid Zhunko, Larissa Sedikova, and Nataliva Ginkut (organizers), Tauric Chersonesos Preserve, Sevastopol, Russia, 5-8 September 2014. List of 28 papers and list of contributors. [Bilingual Russian and English.] See https://www.academia.edu/8636221/Glazed_Ware_in_the_Black_Sea_and_Mediterranean_as_a_Source_for_the_Studies_of_Byzantine_Civilization_abstract_of_the_international_research_seminar_Sevastopol_2014

The 20th Annual Meeting of the European Association of Archaeologists (EAA) was held in Istanbul, Turkey

10-14 September 2014. Participants came from more than 76 countries and more than 2,500 persons attended; for details see <https://www.eaa2014istanbul.org/site> The scientific sessions included 1,949 oral papers and 269 poster presentations; these are tabulated at <https://www.eaa2014istanbul.org/sayfa/161> Two sessions and the portion of a third were devoted to ceramics. A large number of other oral and poster presentations from the meeting are also listed below by author(s) and title.

Out of the Dark – The Dawn of Potters Craftsmanship: Session Organizers: Ingmar Franz and Duygu Tarkan. Ingmar Franz, Ingmar and Duygu Tarkan “Introduction”; Marie Le Mière “Early Pottery and Its First Developments in Northern Mesopotamia: The Role of Import and Imitation”; Aleksandr Vibornov “Three Centers of Pottery Manufacture Forming in the Volga-Kama Neolithic”; Anna Rauba-Bukowska “Pottery as a Transfer of Idea and Meanings in the Early Agricultural Societies in the Upper Vistula River Basin - The Micro and Macroscopic Research”; Lisa Peloschek “Societal Changes and the Development of New Pottery Signatures. Çukuriçi Höyük at the Transition of the Anatolian Neolithic to Chalcolithic”; Ramazan Gündüz “Dark Painted Ceramics Dated Back to 5000 B.C. from West Çatalhöyük”; Trisevgeni Papadaku “Different Ways of Crafting a Pot: Variation in the Techniques of Neolithic Potters in Northern Greece”: Theodor Ignat “The Story of Clay and Memories of Pots...An Interdisciplinary Approach of Potter’s Craftsmanship in Balkan Eneolithic”; Johnny Samuele Baldi “From the Product to the Craftsman. The Emergence of the ‘Profession’ of Potter in the Late Chalcolithic in Northern Mesopotamia”; Luise Lorenz “Production, Distribution and Function of Northern Central European Funnel Beaker Grave Pottery”; Tobias Torfing “Places for Firing in the Northern European Early Neolithic”; and Merethe Schifter Bagge “Potters Craftsmanship – In a Peripheral Point of View.” **Pottery as Experiment: Shifting and Adapting Production Technologies, Functions and Styles:** Session Organizers: Maria Cristina Biella, Orlando Cerasuolo, Antonio Francesco Ferrandes, and Martina Revello Lami. Biella, Maria Cristina Biella et al. “Opening Remarks”; Hülya Çalışkan Akgül “The Red-Black Burnished Ware: A Brand New Pottery Production at the End of the 4th Millennium BC in the Upper Euphrates Valley”; Pamela Fragnoli and Maria Bianca D’anna “Interdisciplinary Investigation on the 4th and 3rd Millennia BCE Pottery Production at Arslantepe-Malatya. Cultural and Technological Interaction, Transmission, Adaptation and Innovation”; Giulio Palumbi “From Obsidians to Ceramics: New Experimental Approaches to Obsidian-Tempered Pottery from Southern Caucasus”; Bettina Bader “Imitated Pottery Vessels in Egypt: An Approach towards

Identification and Classification of a Phenomenon”; Francelin Tourtet “Transitional Cases: Innovation as a Bridge between Three Independent Pottery Wares of the Late 2nd and Early 1st Millennia BC at Tayma (Saudi-Arabia)”; Sofya Panteleeva “Typological and Technological Features of the Sintashta Pottery (South Urals, Russia)”; Alessandro Sanavia “Cross-Craft Interactions and Exchange Models in Protopalatial Phaistos (Crete): The Pottery Evidence”; Jill Hilditch and Irene Nikolakopoulo “Tracing the Wheel from Knossos to Akrotiri: New Perspectives on Ceramic Innovation from the Later Middle Bronze Aegean.” **Almost There: Consumption of ‘Luxurious’ Products among Ordinary People in the Medieval and Early Historic Periods:** Session Organizers: Georg Haggrén, and Gitte Hansen. Georg Haggrén “Sophisticated Table Ware and a Royal Coat-of-Arms? Interpretations of the Deserted Medieval Village of Mankby, Finland”; Wim De Clercq “...parrots, strange wild beasts, pottery called Valenswerc and similar novelties the galleys bring with them...’ The Social Context of Consumption of Late Medieval Mediterranean Singularities in 15th Cent. Flanders (Belgium)”; and Jelena Živković “Beyond Luxurious Appearance: Technological Characterization of Iznik Ceramics from the Belgrade Fortress.”

Contributions on ceramics that were part of other sessions include: Tanya Dzhanezova “Shaping the Future of Painting: The Early Neolithic Pottery from Dzhulyunitsa, Central North Bulgaria”; Beatrijs de Groot “Ceramic Assemblages as Evidence of Social Interaction in Neolithic Anatolia and the Balkans”; Vladimir Koval “Byzantine Pottery in the Cities of Rus’ in the XI-th C.: Evidence of Trade and Urbanization”; Francesca Porta “Pottery and Sea Routes”; Jakub Stępnik “Slavic Vessel – Utility of Construction in Archaeology”; M. A. Kholkina “Changes in the Pottery Tradition in the 4-3rd Millennium BC in the Eastern Part of the Gulf of Finland”; Carmelo Colelli “Pottery Circulation in Aeolis Cyme: Some Remarks on Geometric and Early Archaic Period”; Di Giovanni Vincenzo “The Pottery Circulation in Aeolian Kyme: Some Remarks on Archaic and Classical Period”; Di Giovanni Vincenzo “Pottery Circulation in Aeolis Kyme. An Overview on Hellenistic and Roman Period”; Asa Larsson and Elisabeth Holmqvist Saukkonen “Contact, Change and Mobility Revealed through the Craft of Potters: Identifying Diffusion and Migration in the Baltic Sea Region during the Neolithic”; Isabella Caneva “More on the Neolithic Diffusion: Impressed Pottery from Yumuktepe (Turkey) and Southern Apulia”; Rikke Søndergaard Kristensen “Integration of Chinese Porcelain in A Danish 18th Century Consumer Society”;

Vladimir Slavčev “A Mid-5th Millennium BC Potter’s Workshop in the Settlement near Suvorovo, Varna District, Bulgaria”; Valentine Roux “Standardization of Ceramic Assemblages: Transmission Mechanisms and Diffusion of Morpho-Functional Traits Across Social Boundaries”; Felix Adrian Tencariu, “The Potter’s Craft in Moldavia, Romania. Ethnoarchaeological Research on Ceramic Production and Technology”; Vuković Jasna “Women Labour and Household Production: Emergence of Specialized Potters in the Late Neolithic of the Central Balkans”; Silvia Amicone “Standardization of Vinča Culture Pottery Production at the Dawn of the Metal Age: Preliminary Evidence from the Site of Pločnik, Serbia”; Robert Hofmann “Pottery Standardization and Specialization in the Late Neolithic Okolište: A Case Study from Central Bosnia”; Ina Miloglav “Proposed Model of Ceramic Production within Vučedol Society: A Case Study from Eastern Croatia”; Giorgia Baldacci “Exploring Craftsmanship Through Potter’s Marks in Protopalatial Mesara (Crete)”; Valentina Copat “Assessing Standardization in Maltese Prehistoric Pottery Production: The Case of Borg in Nadur Pottery”;

Robert H. Tykot, Andrea Vianello, and Carla Guzzone “Identification of Local vs. Non-Local Prehistoric Ceramics from Milena (Valle Del Platani, Sicily) Using Non-Destructive PXRf”; Matau Florica “Cucteni Pottery Production, Consumption and Exchange in Eastern Romania: Insights from Compositional Analysis”; Alexis Gorgues “Pottery and Domanian Economy in the Iberian Iron Age: The Mas de Moreno (Foz-Calanda, Teruel) Case”; Zunal, Onur “Ritual Functions of the Ceramics and Metal Objects from the Apollon Clarios Altars”; Volker Demuth “‘Pricy Pots or Convenient Crockery?’ – The Use of Imported Pottery in Late Medieval and Early Modern Norway”; Marcella Giorgio “Pottery as a Luxury in Medieval Pisa? First Data for the Identification of Some Social Markers”; Klara Neumannova, Petr Kvetina, and Richard Ther “Variability of the LNK Pottery Technology at the Site of Bylany” (poster); Svetlana Zyryanova “Early Neolithic Ceramic Traditions of the Population of the Middle Trans-Ural” (poster); Maria Giuseppina Gradoli “Ancient Ceramic Technology and Its Social Meaning: The Bronze Age Nuragic Society of Sardinia”; Emily Miller Bonney “Technological Innovation in the Face of Standardization: The Fine Grey Ware Pyxis as an Agent for Change”; Valasia Isaakidou “Carcasses, Ceramics and Cooking in Neolithic Greece: Towards An Integrated Approach”;

Lucia Mori “Daily Bread. The Origin of Tandır Ovens in Anatolia”; Bartosz Adamski “Beer-Making in Ancient Egypt”; Evita Kalogiropoulou “Culinary Practices and the Formation of Social Spaces: The Contribution of Cooking

Facilities”; Evi Papadopoulou “‘Home Is Where the Hearth Is’: Clay Structures as Spatial Indicators of Cooking Activities in Neolithic and Early Bronze Communities in Northern Greece”; Bulu, Müge “Cooking and Serving Practices at An Amorite Palace: An Intact Kitchen Context from Middle Bronze Age Alalakh”; Laurens Thissen and Rana Özbal “Changing Cooking Practices at Neolithic Barcin Höyük, NW Turkey”; Dushka Urem-Kotsou “Cooking in the Neolithic of North Greece”; Paola Piccione “Guess Who’s Coming to Dinner? Cooking Practices at Arslantepe from 4200 to 2000 BCE”; Christina Karlsson, Christina “Crème De La Crème: Eating at A Hungarian High Status Bronze Age Site”; Elini Hatzaki “Cooking for the Dead: Cooking Vessels from the LBA I Myrtos–Pyrgos Tomb”; Anna Berrocal Barberà “Food Processing Among Early Farmers in NE of Iberian Peninsula: Contributions from the Site of La Draga (Banyoles, Spain)”; Emilie Sibbesson “From Content to Context: Situating Lipid Residues in the British Neolithic” (poster); Suay Şeyma Erkuşöz “Cooking with Neolithic Ovens” (poster); Viktoria Chystyakova “Production of Wine in Thracia and Moesia Inferior on the Territory of Modern Bulgaria: Myth and Reality” (poster); Jana Kopáčková “Production of Wine and Olive Oil in Roman Histria and Dalmatia in the 1st Century BC – 5th Century AD” (poster).

Elisa Biancifiori “‘When Small Size Matters’. Final Bronze Age and Iron Age Miniature Pottery from Latium Vetus”; Maria Grazia Palmieri “Early Iron Age Greek Tripod Bowls in Context. About the Function of a Shape and Its Metal Prototypes”; Elisa Gusberti “Measuring Changes in Pottery. Rome, Middle of the 9th - First Half of The 7th Century BC”; Mottolose, Chiara “Experimental Signs: Symbolic Decoration, Function, and Technique of So-Called ‘Spiral Amphorae’”; Maria Taloni “Diffusion and Transformation of A Particular Kind of Pottery: The So-Called ‘Phoenician-Cypriot’ Oinochoai”; Maria Rosaria Luberto “Pottery Languages in Achaean Colonies in Calabria (South Italy)”; Guilia Rocco “Shapes, Rituals and Images: Preliminary Considerations on the Contexts of Attic Painted Pottery in the Seventh Century B.C.”; Amanda S. Reiterman “The Imperfection of Mass Production: Evidence of Experimentation from the Archaic Potters’ Quarter at Corinth”; Barbara Belevi Marchesini “Pottery Production at Crustumerium: Shapes, Decoration and Function”; Alessandro Quercia “Imitations or Local Variations? The Cultural Transmission of Ceramic Patterns in the Maltese Punic and Roman Pottery”; Claudia Piazzini “Tarquinia, Ancient Pottery Productions and Recent Results.”

Kristina Brkić “Plain Terra Sigillata from Mursa (Osijek, Croatia): A Hybridization within Types and

Decorations”; Malgorzata Kajzer “The Adaptation of Italian Patterns in Cypriot Oil Lamps’ Production”; Raquel Martínez Peñín “Late Antiquity and Early Medieval Ceramic Ware Produced in the City of Braga and Its Surrounding Territory (Portugal)”; Anastasia Dimoula “Community Interaction in the Early Neolithic of Central-Northern Greece: A Pottery Perspective”; Zuzanna Wygnańska “The Case of Clay Andirons - Transmission of Cultic Practices Between EBA and MBA in Northeastern Syria and Anatolia”; Ali Ozani “Impressed Pottery Tradition in the Neolithic Settlement of the Ege Gübre: Regional and Transregional Interactions on the Aegean Coasts”; Emre Ekin “Nicomedia as A Commercial Centre: The Evidence of Late Roman Pottery Imports” (poster);

Van Verrocchio “Postmedieval Ceramic Kilns from Anversa Degli Abruzzi (Italy): A Multidisciplinary Approach”; Barbara van Doosselaere, and Laurence Burnez-Lanotte “Shifting Times, Changing Minds: Potter’s Technical Know-How Evolution during the Early Neolithic in Belgium (Vaux-et-Borset, ca. 5300-4700 BC)” (poster); Hasan Ashkanani and Robert H. Tykot “Understanding Ceramic Production, Standardization and Craft Specialization of Dilmun in the Second Millennium BC: Chemical Characterization of Dilmun Pottery from Kuwait and Bahrain Using Non-Destructive pXRF” (poster); Florica Mata “Diversified Production of Cucuteni Painted Pottery in Eastern Romania” (poster); Kewin Peche-Quilichini “Crafting Technologies (Basketry and Textile) and Tools Used by Sardinian and Corsican Bronze Age Potters. Morphofunctional Analysis of a Technical Discussion” (poster); Pinar Gutsuz, Mustafa Kibaroglu, and Gürsel Sunal “Geochemical Analysis and Preliminary Assessment in Terms of Archaeometry of Clay Sources in Amuq Plain (Hatay)” (poster); Agostino Sotgia “An Overview of Italian Pottery Kilns in the Bronze Age and Early Iron Age” (poster); Alice Quagliuolo “Tarquinia Geometric Pottery Productions: Recent Work” (poster); Claudia Piazzzi and Daniele Teseo “Tarquinia, Bucchero and Impasto Pottery: Recent Work on a Dialectic Encounter” (poster); Barbara Belelli Marchesini “Kilns and Pottery Production in the Pre-Roman Town of Veii (Etruria)” (poster); Marta Recalcati “Tarquinia, Depurated Wares: Recent Work” (poster); Mogilevskaya, Catherine “A Group of Bosphoran ‘Watercolour’ Painted Pelikai from the Hermitage Museum: From Attic Model to Local Phenomenon: (poster); Roberto Knobloch “Native Technology, Roman Vase-shape, Celtic Decoration: The Late Celtic Imitations of Black-Gloss Ware in Cisalpine Gaul” (poster); Goranka Lipovac Vrkljan and Ivana Ožanić Roguljić “Replica of the Roman Ceramics Kiln from Crikvenica” (poster); Silvia Quarello “Tarquinia, Pottery Productions

during the Late Roman Republic and Imperial Times: Recent Work” (poster); Stanislava Kučová, Jiří Musil, and Pavel Titz “Oman Pottery Kilns in Bir Showish, al-Hayz/Bahariya Oasis, Egypt” (poster);

Kosar Rahmani and Javad Neyestani “Continuity and Change in Pottery from the Late Sasanian to the Early Islamic Periods Using Samples from Bonyad Museum and National Museum of Iran” (poster); Ana Jorge “Working with Clay in the Arctic: Exploring Material Engagements in Prehistoric Coastal Alaska”; Alison Klevnas “Inalienable Materials and Ephemeral Forms in Early Medieval Craft Production”; Peter Schmidt “Iron Technology, Clay, and Ritual Practice: An Interactional Domain in African Technology”; Helen Loney “Plenty to Go Around: Impact of the Worcester Royal Porcelain Factory on Local China Values in Worcestershire, UK during the 18th, 19th, and 20th Centuries”; Rezida Khamchenkova, Rinat Valiev, and Sitdikov Airat “The Production of Glazed Ceramics in Medieval Bolgar” (poster); Roos Van Oosten “An (Urban) Cooking Revolution in the Low Countries?”; Filiz Yenişhirlirlioglu “The Journey of Taste: Coffee and Coffee Cups”; Van Verrocchio “Around Kitchen. Ceramic and Metallic Kit through Archival and Archaeological Sources in Abruzzo in the Early Modern Period” (poster); Estr Oras, Aivar Kriiska, Alexandre Lucquin, Lembi Lõugas, and Craig Oliver “Early Pottery Use in Estonia” (poster); Reyhan Şahin “Some Observations on Battle Scenes on the Attic Figured Pottery: Impulses by the Trade Relations with Black Sea in the 4th Century B.C.”; Movchan, Irina “Semantics of the Oghuz Jewelry and Pottery of Aral Region (Report Based on Materials of the Ancient Settlement Kesken-Kuyuk-Kala)” (poster); Deniz Y. Meier “EBA Pottery Sequence from Salat Tepe. First Impressions”; Jesus Gil Fuensantal “Early Bronze Continuity and Disruption in the Turkish Middle Euphrates during the EB I-II: The Tilbes Project-Birecik Case”; Valentina Orsi “Ceramics and Chronologies of the ‘Northern Frontier’: An Open Debate”;

Christian Falb “The Frankfurt University’s Southeast Anatolia Project (SOAP): Retracing Pots and People”; Juliette Mas “Bash Tapa (Iraq) and Its Environment. Third Millennium Pottery from the First Two Excavation Campaigns”; Mustafa Kibaroglu “Tracing the Clay Source of the North-Mesopotamian Metallic Ware from Southeast Anatolia (SOAP Project): An Application of Major, Trace Element and Sr Isotope Geochemistry”; Mustafa Kibaroglu “Chemical and Mineralogical Analysis of the Dark Rimmed Orange Bowls Ware (DROB) from Northeast Syria and Southeast Anatolia: Results and Archaeometric Implications” (poster); Rui

Morais “News About Greek Vasse [sic.] Used to Transport and Conserve Honey”; Pirjo Hamar “Tales of Tiles: Using Roman Roof Tiles in the East (1st-5th C AD).”

Forthcoming Professional Meetings

The 113th Annual Meeting of the American Anthropological Association is in Washington, DC, 3-7 December 2014. One symposium and three additional papers are on ceramic topics. Symposium: Ceramic Ecology XXVIII. Organized and chaired by and Sandra L. Lopez Varela (Universidad Nacional Autónoma de México) and Kostalena Michelaki (Arizona State University), six papers and discussant. (The abstracts of the session and papers are in the previous issue of the *Bulletin*.): “Neo-Assyrian Palace Ware: The Role of Material Culture in an Imperial System” by Alice Hunt (University of Georgia); “Specialization, Standardization and the State: The Case of Syrian Caliciform Ware” by Sarah R Graff (Arizona State University); “The Ceramic Production and Interaction Network of La Reconnaissance, Trinidad during the Early-Late Ceramic Transition (ca. AD 500-800)” by Marcie L. Venter (University of Kentucky), Neal H. Lopinot (Missouri State University, Center for Archaeological Research), Jeffrey R. Ferguson (Missouri University Research Reactor) and Michael Glascock (Missouri University Research Reactor); “The Olleros of Chijipata Alta, Bolivia: Digging, Growing and Spreading an Archaeological Landscape” by Andrew P. Roddick (McMaster University); “Volcanic Tempers: The Case of Coastal Ecuadorian Fineware Ceramic Technology” by Maria Masucci (Drew University); “Terracotta Pottery Traditions in Tepakán, Campeche” by Lorraine A. Williams-Beck (Universidad Autónoma de Campeche); “Discussant” Anabel Ford (University of California Santa Barbara). The three other papers are: “Painting the Ideal Man: The Construction of Elite Masculinity through Maya Ceramics” by Zachary A. Nissen (University of Illinois at Urbana Champaign); “Crafting Community with Plain Pottery at Angel Mounds, Indiana” by Dru E. McGill (Indiana University); and “Slowing Down and Mellowing out with Costa Rican Ceramic Artisans: Late Career Transitions in Ethnographic Research” Jim Weil (Science Museum of Minnesota / Monteverde Institute, Costa Rica).

“*Terracottas in the Mediterranean through Time*” is sponsored by the University of Haifa’s Zinman Institute of Archaeology, Department of Art History and scheduled to be held in Haifa, Israel 23-25 March 2015. This conference is dedicated to the study of terracotta figurines and related objects in the Mediterranean region from the early periods to late antiquity. The meeting aims to bring together scholars and students who often tackle

the same issues as the study clay figurines and related objects from different periods and parts of the Mediterranean region. Scholars who research terracottas of illiterate societies often use anthropological and ethnographical methods, while those studying terracottas of historical periods refer to historical sources and artistic analogies. The various viewpoints and attitudes may enrich and deepen our understanding of terracotta figurines and their role in society. Additional information is available online at

<http://www.archaeological.org/events/15482>

“*In & Around: Pottery & Community*.” AIECM3 is an international association for the study of medieval and modern pottery in the Mediterranean. It organizes the Medieval and Modern Pottery International Conference (CICM3) held every three years. The work of the association has been essential for new achievements and significant reflections about history of pottery. The first Topical Congress was held in Montpellier-Lattes, France, 19-21 November 2014; the second will be held 17-18 April 2015 at the International Museum of Ceramics in Faenza (Ravenna, Italy) and will be titled “In & Around: Pottery & Community.” Topical areas include: 1) Investigating changes in the configuration of the community through the time by plotting pottery distribution. 2) Ceramic consumption and community specialization. 3) Mutual influences between behaviors and pottery: Who used these objects? What did these artifacts mean? How community negotiated their views of others and of their own past through them? And 4) Case studies, synthesis and methodological discussions: multidisciplinary approaches and comparisons among pottery and other artifacts. The chronological range is wide, starting from Early Middle Ages to the present. See [https://www.academia.edu/6792423/2nd International Topical Congress of the AIECM3 In and Around. Pottery and Community](https://www.academia.edu/6792423/2nd_International_Topical_Congress_of_the_AIECM3_In_and_Around_Pottery_and_Community)

ARCHAEOMETALLURGY

Thomas R. Fenn, Associate Editor

The column in this issue includes the following categories of information on archaeometallurgy: 1) New Books; 2) New Book Chapters/Articles; 3) Doctoral and Master Theses; 4) Forthcoming Meetings; 5) Previous Meetings; and, 6) Research Opportunities.

New Books

Nub Nefer–Gutes Gold. Papers in memory of Manfred Gutgesell, edited by Robert Lehmann, Bernd Hamborg, Anne Viola Siebert, Simone Vogt and Christian E.

Loeben, 2014, Hannoversche Numismatische Beiträge 1, Verlag Marie Leidorf (VML), Rahden/Westf., ISBN: 3867576866 (hbk.); 9783867576864 (hbk.).

This volume is dedicated to the memory of Manfred "Rudi" Gutgesell [1948-2011]. It contains a foreword of the editors, an obituary, an appraisal of his commitment to the exhibition "Olympia-money and sport in antiquity" in 2004, a bibliography of the honored, 25 papers, and an appendix of numismatic commercials. The contributions deal with the history of the Numismatic Society at Hannover, Egyptian coins, coins in Attic comedies, different Greek coins and medallions, a denarius/quinarius with an iron core, Caesar's Spanish governorship in coin images, Roman silver bars, astrological signs of conception on antique coins, coins of Emperors Claudius and Caracalla, Egyptian deities in Asia Minor, elephants in antique art, early coins from the town of Merseburg, an Anglo-Saxon moneyer, coin trade around A.D. 1600, mock coins and coin mockery in the 17th century, coins of Alexander the Great in the Royal Coin Cabinet at Berlin around 1818, numismatic experiences during August Kestner's journey through Sicily in 1824, Roman *aessignatum* and *aes* grave money in the Haebler Collection, money and monetary value in Abyssinia as well as coin trade and duty of care.

Contributions to the volume include "Geld und Geldwert in Abessinien. Der Frankfurter Forschungsreisende Eduard Rüppell (1794-1884)" (Frank Berger), "Eine Litra von Katane und das Brüsseler Aitna-Tetradrachmon" (Christof Boehringer), "Zur Erinnerung an Dr. Manfred Gutgesell (1948-2011), Ägyptologe und Antiker Numismatiker" (Rainer Cunz), "Der Bestand an Münzen im Namen Alexanders des Großen im Königlichen Münzkabinett um 1818" (Karsten Dahmen), "Zur Arethuse de face des Graveurs Kimon" (Wolfgang Fischer-Bossert), "Olympia - Geld und Sport in der Antike. Rudi und das Demareteion" (Bernd Hamborg), "Caesars spanische Statthalterschaft im Münzbild" (Wilhelm Hollstein), "Ein Denar/Quinar mit Eisenkern" (Peter Ilisch), "Der Verkauf der Sammlung Rüeger. Ein paar Bemerkungen zu Münzhandel und Freundschaft um 1600" (Ursula Kampmann), "Münzhandel und Sorgfaltspflicht" (Fritz Rudolf Künker), "150 Jahre Tradition - Vergangenheit - Gegenwart - Zukunft. Vom Münzforscherverein bis zur Numismatischen Gesellschaft zu Hannover e.V." (Robert Lehmann), "Römische Silberbarren als Legionsgeld - Analysen zur Herstellung und Funktion der Funde aus Niedersachsen" (Robert Lehmann, Carla Vogt), "Zur Verbreitung ägyptischer Gottheiten in Kleinasien. Eine bisher unbekannte Homonoia-Prägung aus Ephesos" (Wolfgang Leschhorn), "Nektanebos" (Christian E. Loeben), "Agathos Daimon -

Alexander - Antinoos?" (Katharina Martin), "Die Anfänge der Münzprägung in Merseburg und ein kleiner Beitrag dazu aus Hannover" (Manfred Mehl), "Bemerkungen zum sog. „Typus Turin“ des Kaisers Claudius" (Alexander Mlasowsky), "Die Antinoos-Medaillons von Bithynion/Hadriané (Klaudiupolis). Nachträge" (Hans Christoph von Mosch), "Rom, Perinthos oder Tyros? Die Schnecke gibt die Antwort" (Dieter Salzmann), "Pharaonische Münzen im Roemer- und Pelizaeus-Museum Hildesheim" (Bettina Schmitz, Regine Schulz), "„Der Tag schloß wieder mit Münzhandel“, Numismatische Erlebnisse während August Kestners Sizilien-Reise 1824" (Anne Viola Siebert), "NORDMAN aus LÆPES - Ein angelsächsischer Münzmeister zwischen den Fronten" (Sebastian Steinbach), "Konzeptionszeichen auf antiken Münzen?" (Jens-Ulrich Thormann), "Spottmünzen und Münzenspott - Beispiele des 17. Jahrhunderts in der Sammlung des Museum August Kestner" (Simone Vogt), "Machtsymbol und Kampfmaschine - Der Elefant in der Kunst des Altertums" (Uta Wallenstein), "Münzgeld in Attischen Komödien" (Wolfram Weiser), and "National wertvolles Kulturgut. Die Sammlung grömischen Schwergeldes von Ernst Justus Haebler" (Bernhard Weisser). More information can be found at the publisher's website: <http://www.vml.de/e/detail.php?ISBN=978-3-86757-686-4>.

New Book Chapters/Articles

From the book *'Hidden Histories and Records of Antiquity': Essays on Saxon and Medieval London for John Clark*, Curator Emeritus, Museum of London, edited by J. Cotton, J. Hall, J. Keily, R. Sherris, and R. Stephenson, 2014, London and Middlesex Archaeological Society Special Paper 17, London and Middlesex Archaeological Society (LAMAS), London, UK, comes "A Saxon brass bar ingot cache from Kingsway, London" (Justine Bayley, Jonathan Cotton, Thilo Rehren, Ernst Pernicka; pp. 121-128).

The book *X Congreso Ibérico de Arqueometría: Actas*, edited by David Juanes Barber and Clodoaldo Roldán García, 2014, is the proceedings of the 2013 Congreso Ibérico de Arqueometría. This book is part of the series *Actas de los congresos organizados por la SAPaC*, by the Sociedad de Arqueometría Aplicada al Patrimonio Cultural (SAPaC). This annual Iberian archaeometry conference includes session of oral and poster presentation on archaeometallurgy.

Oral presentations on metals included in the proceedings comprised "Caracterización de una pieza de hoja lata proveniente del sitio arqueológico Posta El Caldén, finales del siglo XIX (La Pampa, Argentina)" (F. Caretti,

E. Montanari, H. de Rosa, C. Landa; p. 241), “Plomo metálico en yacimientos de la I Edad del Hierro en la Provincia de Castellón: Explotación de recursos mineros y circulación del metal” (I. Montero-Ruiz, G. Aguilera, C. Rovira-Ortolá; p. 252), “Caracterización no destructiva de piezas arqueometalúrgicas del siglo XIII (Excavación del castillo de Ereñozar) mediante fluorescencia de Rayos-X” (M. Veneranda, J. Aramendia, S. Fdez-Ortiz de Vallejuelo, L. García, M. Neira, K. Castro, I. García, A. Azkarate, J.M. Madariaga; p.266), “Estudio comparado de dos navíos franceses de la Batalla de Trafalgar: los elementos de fijación estructurales del Fougueux (1785-1805) y Bucentaure (1804-1805)” (N. Ciarlo, M. Rañi, H. de Rosa, M. C. Luchetta, P. Marino, N. Rodríguez, J. Martí; p.268), and “Objetos metálicos de base cobre del yacimiento de Cueva Pintada (Gáldar, Gran Canaria)” (C. Gutiérrez, M. Gener, M. C. González, I. Montero-Ruiz, J. Onrubia, J. I. Sáenz; p. 281).

Poster presentations included in the proceedings consisted of “El Archivo Au: Acceso público y puesta en valor” (P. C. Gutiérrez-Neira, O. García-Vuelta y A. Perea; p. 403), “Una aproximación a la tecnología metalúrgica postalayótica a través del estudio de los tintinabula” (L. Perelló Mateo, B. Llull Estarellas; p.404), “Observaciones sobre un caso de producción artesanal en serie: Análisis metalúrgico de las tachas de revestimiento de forro halladas en el sitio Deltebre (1813)” (Nicolás C. Ciarlo, Marina Rañi, Horacio M. De Rosa, Gisela Maxia, Rut Geli Mauri y Gustau Vivar Lombarte; p.425), “Estudio preliminar de la metalurgia del plomo y la plata en la Ciudad Fenicia de Baria” (S. CarpinteroLozano; p.426), “Análisis de artefactos de metal proveniente del sitio arqueológico Vuelta de Obligado, Provincia de Buenos Aires, Argentina” (Horacio De Rosa, Mariano Ramos, Ariel Lopez, Verónica Helfer, Matilde Lanza, Alejandra Raies, Marina Rañi; p.428), and “Determinación del uso de bocado metálico en los caballos de la edad del hierro del territorio valenciano mediante la utilización de microscopía electrónica de barrido en modo medioambiental” (M.P. Iborra Eres, F. M. Valle Algarra, M. A. Ferrer Eres, J. V. Gimeno Adelantado; R. Martínez Valle; p.429).

The most recent edition of *The Crucible* (Issue 86, Summer 2014) is available from *The Historical Metallurgy Society (HMS)*. The issue includes 28 pages of news, correspondence, interviews, meeting notes, book reviews, and more. A PDF version of the issue is at: http://hist-met.org/images/HMS_news_86.pdf.

From the *Journal of Archaeological Science* (2014, Vol. 52) comes “Electrochemical reconstruction of a heavily corroded Tarentum hemiobolus silver coin: a study based

on microfocus X-ray computed microtomography” (Benedetto Bozzini, Alessandra Gianoncelli, Claudio Mele, Aldo Siciliano, Lucia Mancini; pp. 24-30), and “Feasibility studies of Sn isotope composition for provenancing ancient bronzes” (E. Yamazaki, S. Nakai, Y. Sahoo, T. Yokoyama, H. Mifune, T. Saito, J. Chen, N. Takagi, N. Hokanishi, A. Yasuda; pp. 458-467).

From *Archaeometry* (2014, Vol. 56, No. 5) comes “The use of neutron analysis techniques for detecting the concentration and distribution of chloride ions in archaeological iron” (D. Watkinson, M. Rimmer, Z. Kasztovszky, Z. Kis, B. Maróti, L. Szentmiklósi; pp. 841-859).

From *Environmental Science and Technology* (2013, Vol. 47) comes “Use and legacy of mercury in the Andes” (Colin A. Cooke, Holger Hintelmann, Jay J. Ague, Richard Burger, Harald Biester, Julian P. Sachs, Daniel R. Engstrom; pp. 4181-4188).

Doctoral & Master Theses

Empire Without A Voice: Phoenician Iron Metallurgy and Imperial Strategy at Carthage, by Brett Sanford Kaufman (Doctor of Philosophy thesis, Archaeology, University of California, Los Angeles), 2014, xx+477 pages, 26 figures, 8 tables, 5 appendices.

The role of iron in the emergence of Iron Age states in North Africa and the Near East has been poorly understood due to a paucity of contemporary, diachronic ferrous archaeometallurgical data. Excavations at Phoenician and Punic Carthage in the 2000s recovered one of the largest and most diverse corpora of Iron Age iron production material culture from North Africa and the Near East, spanning the entire history of Carthage from its Tyrian colonial foundations to its destruction by Rome (historical dates 814-146 BC). Analysis of the materials employing metallography, portable X-ray fluorescence spectroscopy (pXRF), and variable pressure scanning electron microscopy coupled with energy x-ray dispersive spectroscopy (VPSEM-EDS) indicates that Carthaginian smiths were smelting and smithing wrought iron and steel as an exchange good or tribute commodity to Tyre and the Assyrian empire, as well as producing, refining, and consuming tin and arsenical bronzes, leaded bronzes, lead, and cobalt. Archaeological evidence demonstrates a state industry of iron production, including the commissioning, decommissioning, and outsourcing of metallurgical precincts. There is an overwhelming difference exhibited between output capacity at industrial and household production sites. Epigraphic evidence in Punic illustrates the inherent economic and familial affiliations between the

Carthaginian state and metalworkers. Ironsmiths, bronze casters, and goldsmiths were privileged engineers of one of the state's most strategic industries, and were stratified in a hierarchy of technical specialties and ranks. In order to conserve fuel and succeed in properly vitrifying ore or bloom impurities into slag, they recycled industrial byproducts in the form of murex shells from purple dye production as a metallurgical flux and lined the furnaces with quartz-rich heat insulation. Carthage was one colony in the Phoenician commodity procurement network, whose task it was to convert iron blooms into final products. By the time this colony became independent of Tyre ca. 650-550 BC, the smiths of Carthage already had around a century of expertise in the production of iron and steel implements which gave the state a competitive advantage in the strategic arena of ferrous technologies and the formation of empire. [Abstract by thesis author]

Forthcoming Meetings and Conferences

This one-day workshop, *Gold of the Afterlife: Analytical Approaches to Egyptian Jewellery*, will be held November 3, 2014, at the Institute of Archaeology, University College London (UCL). This workshop is hosted by the Institute of Archaeology, UCL, and is sponsored in collaboration with project PICS 5995 CNRS (National Centre for Scientific Research in France), entitled "Analytical study of Bronze Age Egyptian gold jewelry" Presentations and discussion at this workshop will debate the art of the goldsmith in Ancient Egypt, and provide an overview of analytical data obtained during this 3-year project on the collections in the Petrie Museum of Egyptian Archaeology UCL, the National Museums Scotland, the British Museum, the Garstang Museum of Archaeology Liverpool, and the Louvre Museum. The workshop brings together specialists in archaeometry, 3D-imaging, and Egyptology, from different European countries, with the aim of stimulating interdisciplinary discussions, comparing the evidence for production in precious metal, glass and related pigments from second millennium BC Egypt.

Presentations in the workshop include the "Opening & introduction to PICS 5995" (Maria F. Guerra, Marcos Martín-Torres, Stephen Quirke, Thilo Rehren), "Overview of ancient metallurgy and alloying with gold in Egypt" (John Merkel), "Goldsmiths on Middle Kingdom monuments" (Marcel Marée), "New Kingdom gold: Colour and construction" (Jack Ogden), "Discussion: Development in Egypt of the work of gold and other precious materials" (with the participation of Ian Freestone, Janet Ambers, Marcos Martín-Torres), "Visualising the reflectance from the gold band on an Egyptian scarab from the Petrie Museum Collections" (Lindsay Macdonald, Stuart Robson), "Corrosion of

goldwork collections and the case of the foils from John Garstang's excavations in Abydos" (Isabel Tissot), "Goldsmithing technology of Egyptian Bronze Age jewellery in the collections of the British Museum" (Nigel Meeks, Susan La Niece), "The gold catfish pendants and necklaces from Harageh at National Museums Scotland" (Margaret Maitland, Lore Troalen), "Gold of the "poor" periods: Egyptological comments on alloys used in jewellery from Egyptian Second Intermediate Period contexts" (Stephen Quirke, Maria F. Guerra), "Artefacts of excavation: Examining finds distribution 1880-1980" (Alice Stevenson), and closes with a final "Discussion."

Registration is free but places are limited and advance booking is required. For booking and enquiries contact Maria F. Guerra at maria.guerra@cncrs.fr.

The next "Use-Wear" conference of the *Association of Archaeological Wear and Residue Analysts* (AWRANA; <http://www.awrana.com/>), will be held at Leiden University, the Netherlands, from Wednesday, May 27 to Saturday, May 30, 2015. Included in this conference is a session entitled "Metalwork use-wear analysis: The loss of innocence" (Session organizers: Andrea Dolfini, Newcastle University, and Rachel Crellin, University of Leicester). The session abstract is as follows: The last fifteen years have seen the publication of numerous studies in which the methods of micro-wear analysis have been applied to ancient and historic metalwork, and in particular to prehistoric copper alloys. These studies focus on various classes of artifacts including axe-heads, swords and halberds, spanning from the Mediterranean to the Nordic countries and from Eastern Europe to Ireland. The most important achievements include the realization that, from the Late Neolithic to the late Bronze Age, metal axes were mainly used for woodworking; the reassessment of Bronze Age warfare based on the examination of combat marks on swords; and revolutionary insights into the use of Early Bronze Age halberds as actual weapons, as opposed to previous readings stressing their purely symbolic function.

Despite the giant leap forward made by metalwork use-wear analysis in this time-span, a number of unresolved problems and limitations still constrain its full development, thus delaying the 'loss of innocence' that, inevitably, must characterize the coming of age of this field of studies. These include, among others, (1) great variation in the procedures applied by analysts as well as great diversity in (and occasionally poor formalization of) the protocols designed for the tests with replica tools and weapons; (2) issues of comparability with the traces observed on lithic and osseous artifacts due to the partly

different procedures employed for metalwork analysis, and the lack of targeted comparative studies; (3) the dearth of shared databases of manufacturing and wear marks, and variations in the terminology adopted to describe the marks; (4) and the fact that most metalwork analysts lack the formal training of micro-wear analysts.

The papers presented at this session will seek to explore the achievements and limitations of metalwork wear studies as emerged in the last fifteen years, focusing in particular on the aforementioned and related issues. They will also investigate multidisciplinary approaches in which use-wear analysis is enhanced by other analytical techniques such as metallography, SEM microscopy, 3D imaging and X-raying. Finally, papers will be considered that discuss how use-wear analysis may enrich the archaeological, historic and biographical interpretation of ancient metalwork. The link for the session can be found at:

<http://archaeology.leiden.edu/awrana/sessions/metalwork-use-wear-analysis-the-loss-of-innocence.html>.

Abstracts should be submitted by October 21, 2014. More information about the conference, venue, accommodations and registration can be found at the conference website:

<http://archaeology.leiden.edu/awrana/>.

The *Metallurgical & Materials Engineering Congress of South-East Europe (MME SEE 2015)* will be held in Belgrade, Serbia, from June 4-5, 2015. The Congress is organized jointly by the Association of Metallurgical Engineers of Serbia, Faculty of Technology and Metallurgy, University of Belgrade, Serbian Foundrymen Society and Metallurgical Academic Network of SEE Countries, and represents fusion of few scientific events. The Congress is supported by SEE Associations of Metallurgical Engineers; Balkan Union of Metallurgists and Chambers of Commerce of SEE Countries.

MME SEE 2015 will bring a wide range of related topics presenting the views from both academia and industry. Authors from universities, research centers and industries are invited to submit papers to the Congress. The event includes keynote lectures, scientific and technical presentations, technical tours as well as a comprehensive exhibition and remarkable social events. One of the topics for this year's meeting is "Archaeometallurgy". Deadline for abstract submission is February 15, 2015. More information about the conference can be found at: <http://www.mme-see.org/>.

The *Historical Metallurgy Society (HMS) Research in Progress Meeting* will be held Friday, November 14,

2014, at the Rewley House, Oxford, UK. This meeting is aimed at a wide variety of contributors, from historical and archaeological metallurgists to excavators, historians and economists. The objective is to have presentations and posters from anyone working on projects related to archaeological or historical metallurgy, and the organizers are particularly interested in bringing together contract and public sector archaeologists with academic researchers, and in fostering links between the different disciplines studying metallurgy and related activities. A prize is awarded for the best presentation by a student (or recent graduate within 12 months of graduation) at the meeting as chosen by those members of HMS Council present.

Oral presentations to be made at the meeting include "Grating-jointed bronze steamer in 11c BCE-8c BCE China: Structure, manufacturing technique, spatial distribution and valuable insight" (Zheng Yao Jin), "Recent studies on zinc production in Yunnan province, southwest China" (An-Chuan Fan, et al.), "Experimental and Analytical Investigation of Black Bronze Alloys" (Agnese Benzonelli, et al.), "Bronze Age tin: Tin isotopes and the sources of Bronze Age tin in the Old World" (Ernst Pernicka), "Metalworking and trade in the Pre-Islamic Sahara: Evidence from Fazzan in Libya" (Aurélie Cuénod), "What does the destination tell us about the journey? Characterising copper-alloy histories using chemical composition and lead isotope ratios" (Peter Bray), "Metal-working ceramics in Roman Britain" (Carlotta Gardner, et al.), "The evolution of smithies from 11th to 19th c. in Estonia" (Ragnar Saage), "A working model: Correlating changes in casting technologies with the dynamic social significances of brooches in early Anglo-Saxon England" (Toby Martin), "ALBIMEH – A project for the study of Atlantic Late Bronze Age interaction through metal hoards" (Xosé-Lois Armada), and the meeting closes with a "Keynote" talk by A. Mark Pollard. A PDF of the oral presentations program for the meeting can be found at: http://hist-met.org/images/events_files/HMS_RinP_Programme_2014.pdf.

The international conference *Archaeometallurgy in Europe IV* will be held in Madrid, Spain from 3-6 June, 2015. *Archaeometallurgy in Europe (AIE)* has been organized every four years since 2003: in Milan, Italy (2003); Grado-Aquileia, Italy (2007); and, Bochum, Germany (2011). The Madrid Edition represents the consolidation of the most important forum for scientific discussion on early metalworking in Europe and far abroad. All this has been possible thanks to the support and generosity of many researchers and institutions, but most of all the organizers want to thank every participant

who attended the last three conferences. The scientific meeting in Madrid is organized by the Institute of History of the Spanish National Research Council (CSIC) in collaboration with the National Center for Metallurgical Research (CENIM-CSIC), the Autonomous University of Madrid (UAM) and the German Archaeological Institute (DAI-Madrid).

The organizers cordially invite the submission of abstracts for oral or poster presentations to the International Conference **Archaeometallurgy in Europe IV. Madrid** Edition, 3-6 June, 2015. Please follow the instructions of the registration form at the end of this announcement. There will be 6 sessions covering the following main themes under which fall a wide range of possible topics:

- Early metallurgy: technological innovation and social negotiation
- Developments: new materials, alloys and processes
- Technological transmission, change and persistence
- Mines, mining and the miner
- Archaeometallurgy *versus* Archaeometry: you first
- Comparative studies

Due to space and administrative restrictions we are limited to a maximum of 90 oral papers and 60 posters. Proposals will be selected by the Scientific Committee. The deadline for abstract submission is November 15, 2014. A PDF version of the first Call for Papers circular can be found at the following link: http://www.congresos.cchs.csic.es/aie4/sites/default/files/4aie_-_first_circular_0.pdf.

A template for the abstract submission form can be found at the following link:

http://www.congresos.cchs.csic.es/aie4/sites/default/files/abstract_template.doc. Further information about the conference, the organizers, call for papers, venue, registration, program and other links can be found at: <http://www.congresos.cchs.csic.es/aie4/conference>.

Previous Meetings and Conferences

A one-day workshop, *Egyptian Gold: Ancient Context, Modern Analysis*, was held Thursday, October 16, 2014. This workshop was hosted by the National Museums Scotland and sponsored in collaboration with project PICS 5995 CNRS (Centre national de la recherche scientifique) entitled “*Analytical study of Bronze Age Egyptian gold jewellery*”. The workshop will examine the archaeological context, symbolism, and production processes of gold jewellery excavated in royal and elite burials of the Middle Kingdom and Second Intermediate Periods (c. 2055–1550 BC). Presented papers included “Procurement to adornment: Archaeological perspectives

on Egyptian gold and gemstone mining” (Ian Shaw), “Analytical strategies for the study of Egyptian jewellery” (Maria F. Guerra), “Harageh Tomb 72 and the symbolism of fish pendants” (Margaret Maitland). “Analysis of jewellery from Harageh Tomb 72” (Lore Troalen), “Goldsmiths on Middle Kingdom monuments” (Marcel Maree), “The jewellery equipment of Middle Bronze age burials in Egypt” (Wolfram Grajetzki), “Amuletic jewellery from Riqqeh Tomb 124 in the Manchester Museum” (Campbell Price), “Analysis of jewellery from Riqqeh” (Matthew Ponting), and “The jewellery of the Qurnah ‘queen’: craftsmanship and adornment in the Second Intermediate Period” (Lore Troalen, Margaret Maitland). More information about the workshop can be found at the following link: <https://www.eventbrite.co.uk/e/egyptian-gold-ancient-context-modern-analysis-tickets-12751884229>.

Research Opportunities

The *Central Timna Valley (CTV)* Project will be conducting an archaeological fieldwork session in February 2015. The CTV is a multi-year project of the Institute of Archaeology at Tel Aviv University, focusing on copper production sites in the southern Arava Valley at the transitional period between the Late Bronze and Iron Ages (1300 – 800 BCE). The excavations are aimed at addressing social, technological and chronological aspects of the ancient copper production industry. Field work is conducted on a small scale, designed to address specific research questions, and is complemented by various laboratory analyses of the different archaeometallurgical finds. The project is based on two intensive weeks of field work, excavations, lectures and field trips to various ancient copper production sites, with emphasis on learning different excavation methods and understanding technological evolution from the dawn of metallurgy to the Islamic period, as shaped by the environmental background (geology of the ore deposits, regional ecology etc.).

The registration deadline is January 25, 2015. More information about the dates, registration, accommodations, and more, can be found at the project website: <http://archaeology.tau.ac.il/ben-yosef/CTV/current/index.html>.

BOOK REVIEWS

David Hill, Associate Editor

Quantitative Analysis in Archaeology. Todd L. VanPool and Robert D. Leonard, 2011. Wiley-Blackwell,

Chichester, UK and Malden, MA. xxii + 350 pages, 99 figures, 91 tables, 5 appendices, bibliography and index.

Reviewed by Thomas R. Rocek, University of Delaware.

Quantitative Analysis is a well written introductory text that takes a common sense, bottom up approach. The book's organization is well thought out, beginning with a general introduction to the subject of quantification in archaeology and the types of data that archaeologists quantify, proceeding to a survey of graphical examination of data, followed by descriptive statistics and probability, then confidence intervals and hypothesis testing and concluding with an introduction to commonly used univariate (and very briefly multivariate) statistical techniques. Similar material is covered by any introductory statistics text, but as the authors explain, their goal is to introduce the material at a level accessible to students who are intimidated by mathematics and to make the relevance of the material clear to archaeologists by framing it specifically around archaeological examples. In both goals they succeed well, though those who panic at the sight of an equation might still find some of the discussion a good mental workout.

In going through the book, I was struck by a substantial number of strengths. The authors emphasize the need for a foundation in the theory underlying statistical methods rather than leaping into cook-book analyses without an understanding of how they relate to the research questions of interest. In developing this approach, they introduce early on the necessity of simple data exploration prior to elaborate statistical manipulation, making clear that data need to be looked at and worked with, not simply shoved into a statistical package.

Most impressively, the authors work hard at providing thoughtful and not dumbed-down verbal explanations of the reasoning behind the techniques that they cover and the process of calculating the results. Rather than emphasize formal proofs as in more advanced statistical texts or alternatively presenting "take my word for it" formulae (or "here is the command sequence in this statistical package"), they work the reader through the reasoning behind the elements of the equations underlying the techniques and what they represent. They do this using archaeological examples and have the reader work through the reasoning and mechanics of hand calculating the results. My only criticism of this aspect of the book is that in (a few) cases the emphasis on *hand* calculation perhaps results in an over-emphasis on equations reformulated for ease of calculation; the more useful discussions emphasize the equations in the form that highlights the reasoning underlying their derivation

rather than algebraically reworked to make for easier hand computation. But on balance most of the examples walk the reader through the elements of the equations very effectively and highlight the logic behind the methods. I found the chapter on linear regression particularly well presented.

A third strong aspect of the book is discussion of the importance of thinking through statistical power and the danger of type II errors in hypothesis testing. Although the book only briefly addresses sampling, this introduction to power analysis is a foundation for planning research and evaluating both positive and negative results of hypothesis testing.

Finally, although I noticed a couple of Greek letter/symbol font problems, they are rare and only one that I saw (on page 117 where the letter *pi* got substituted for a not-equals sign) are likely to lead to confusion.

There are areas that could be stronger. The book is certainly an introductory text, and many techniques and contexts of analysis are not addressed--but this includes at least one area I would have expected to receive some mention: archaeological dating and issues relating to interpretation of radiocarbon dates, seriation, and most notably Bayesian statistics; in fact the latter is not mentioned at all despite its ubiquity in archaeological dating literature. I would also have liked to see a glossary (though the index is good) and while the emphasis on hand calculation and inclusion of appendices of common statistical tables is helpful, some references to online sources for both tables and calculation tools would be helpful. Another potential weakness is that while the discussions of the various statistical methods do introduce the assumptions underlying each technique, the emphasis on these assumptions is uneven; the chapter on regression clearly and prominently summarizes the importance of those assumptions while the assumptions underlying some other techniques such as ANOVA and F-tests are less highlighted and might be skimmed over by the careless student. At the level of content (and within the constraints of my own statistical background), I did not recognize errors except perhaps the rule of thumb suggestion (p. 313) for sample sizes to be drawn from large collections based on sample percentages; on the other hand the subsequent discussion on p. 314 correctly discusses estimating needed sample size based on variation in the variable of interest.

In summary, this is a very useful book, and I would strongly consider it for an undergraduate statistics course for anthropology (and particularly archaeology) students, probably used in conjunction with a few additional sources for particular topics I would want to cover. I

much prefer it to books that are structured around direct application to statistical packages; that can easily be taught alongside the more important fundamentals that this text introduces.

Re-Creating Primordial Time: Foundation Rituals and Mythology in the Postclassic Maya Codices by Gabrielle Vail and Christine Hernández. The University of Colorado Press, Boulder, 2013. xvii+503 pp., 153 figures, 50 tables, 15 appendices, bibliography, index. \$85.00 (cloth).

Reviewed by Adrienne M. Tremblay

The study of the few surviving Maya codices has long focused on the astronomical and divinatory nature of their calendric texts with less attention on the mythic quality of their iconography and hieroglyphic texts. Gabrielle Vail and Christine Hernández's *Re-Creating Primordial Time: Foundation Rituals and Mythology in the Postclassic Maya Codices* represents a nuanced and comprehensive analysis of the complex connections among the iconography, texts, and astronomical cycles of the codices within the context of Maya narratives of cosmogony. The authors look to colonial sources such as the Popol Vuh of the K'iche Maya and the Books of Chilam Balam from the Yucatán peninsula, ethnographic sources from Yucatán and Highland Guatemala, and pre-Columbian texts and iconography from the Classic and Postclassic periods to explain themes found in the codices. These include the primordial events of creation, world renewal and Yearbearer ceremonies, floods and cosmogony, and the roles of Chaak, ChakChel, the Venus gods, God L, and other deities in the creation of our current universe and the events immediately afterwards.

The authors contend that the codices contain not just astronomical cycles and predictions to be used in divination but also contain mythological narratives about how the universe came into existence. These narratives helped the user of the codex to make prognostications and determine which rituals were appropriate to help or hinder that prediction. The diviner invoked the mythic past within the present by performing ritual acts that were once performed by the gods. The analysis of the Dresden Codex shows that these codices not only depicted events and gods associated with creation but also functioned as guides or explanations of rituals performed at various times of the year. For example, their analysis of the Dresden Yearbearer pages in Chapter 4 demonstrates that the text and iconography reference the foundation events of creation found in Classic Period texts such as the setting of the three hearth stones, the ordering of the gods, the establishment of ritual space through pacing it off,

and setting up the world trees. Scholars have known that these pages refer to the ceremonies performed at the beginning of the new year; however, the authors argue that these ceremonies also functioned as reenactments of the actions of the gods during creation which allowed the Maya to invoke the mythic past of creation into the present and hopefully ensure a good rainfall and an "abundance of food."

The first three chapters of the book contain background materials on the Maya codices, Mexican codices and creation myths, and Maya creation myths from the pre-Columbian and colonial periods. Chapters 4 through 7 focus on the Dresden codex and Chapters 8 and 9 on the Madrid Codex, while Chapter 10 reexamines the relationship between the Sip deities and the Mars peccary, God L and his relationship to Chaak and the Pawahtuns, and other deity complexes (a group of deities with similar attributes and duties that act together or substitute for one other). Of particular interest in Chapter 10 was the authors' analysis of the role of the deity complexes of Oxlahun Ti' K'uh and Bolon Ti' K'uh. Deity complexes have been known in Maya hieroglyphic texts but are poorly understood. This analysis provides new insight on how they may have functioned in the mythic past as well as in the historic present.

Unfortunately, the illustrations are hard to see and sparse for a book discussing pictorial manuscripts. The authors compensated for this by having further illustrations online from their database, but the placement of the UPC codes alongside and the long URLs within the text can be distracting to the reader. In addition, the analysis of the text and iconography is highly complex and not geared toward the novice scholar. The authors do a good job of presenting the analysis as clearly as possible, but due to the nature of the subject matter the discussion is very detailed and can be difficult to follow, especially if the reader is not familiar with the topic. However, for scholars interested in Maya myths and gods, ritual, and prognostication in the codices and other texts this book will be an extremely valuable resource.

Costopoulos, Andre, and Mark W. Lake. 2010 *Simulating Change: Archaeology Into the Twenty-First Century*. University of Utah Press. Salt Lake City, Utah. 73 pp. \$25.00 (paperback), ISBN-978-1-60781-036-0.

Reviewed by Lewis Borck, University of Arizona

This book came out of a 2005 Society for American Archaeology meeting session in Saint Louis entitled, "The State of Computer Simulations in Archaeology."

This volume reflects two primary themes on computer simulation. The first theme, which will draw many researchers to this book, explores Agent Based Models (ABMs) within archaeology. Premo's and Reynolds et al.'s are both good examples of the application of ABMs to archaeology. Premo's chapter delves in to how ABMs allow archaeologists to examine historical processes from a bottom-up perspective and allow archaeologists to virtually interact with past groups. Reynolds et al. details how ABMs can be applied to particular groups and that information storage becomes a key toward group success.

The second theme examines early research that used computer simulation to answer difficult questions and how this has changed with the years. The introductory chapter by Costopoulos et al. is an in-depth review of early use of computer simulation in archaeology. Wobst's chapter follows this historical overview but pairs it with the changing landscape of computer simulation in archaeology. As Wobst is himself a pioneer in this realm, his voice carries a particular resonance when he discusses the early failure of computer simulation to gain popular acceptance in archaeology. This theme is continued with Lake's discussion of the future of computer simulations in archaeology, Costopoulos' discussion on the early days of computer simulation and the importance of evaluating your model and then capped by Aldenderfer's comments on the importance of visualization and using real-world data in these simulations.

I am sure researchers will draw on this volume in the future as it has many detailed overviews of the history of computer simulation in archaeology as well as discussing the advantages of using simulations for investigations of the past.

White, Devin Alan, and Sarah L. Surface-Evans. 2012 *Least cost analysis of social landscapes: archaeological case studies*. University of Utah Press, Salt Lake City, Utah. 268 pp. \$55.00 (cloth). ISBN-978-1-60781-171-8

Reviewed by Lewis Borck, University of Arizona

This book originated with a 2009 Society for American Archaeology meeting session entitled, "Tracing trails and modeling movement: Understanding past cultural landscapes and social networks through least cost analysis." The book contains 14 chapters with an introductory overview chapter on least-cost analysis (LCA) by Surface-Evans and White. A similar, but more critical, overview is found in Kantner's chapter, which focuses on differences between basic ways to implement LCA and the necessity for applying an anisotropic model instead of the isotropic one that is black-boxed within at

least one major Geographic Information Systems (GIS) supplier's software package. While most of the case studies in this book utilized an anisotropic model, only White's chapter gave in-depth details as to how he implemented the anisotropic calculations.

In chapters by both Rademaker et al. and Anderson, the authors discuss the differences in path selection between groups that are traveling over unfamiliar landscapes versus those that are traveling over familiar landscapes. This is an important distinction that many researchers do not discuss and it was refreshing to see it highlighted here. Branting examines the problem of reconstructing paths if crossed obstacles are not given adequate costs. He overcomes these problems by applying a vector approach, which many archaeologists might not find useful as they work outside urban environments where routes are not restricted. The final three chapters raise some important questions for determining how researchers can begin to plan ways to apply LCA and how readers can assess the quality of LCA studies.

Researchers interested in and using least-cost analysis will likely reference this book for some time to come. Most chapters contain interesting insights and valuable new ideas for those interested in working with least-cost paths. For example, Nolan and Cook address the economic impact of trade routes by adding harvest returns, Richards-Rissetto integrates space syntax analysis, Surface-Evans examines a process for identifying corridors of least-cost between two locations that utilizes the cost surfaces of movement from and to both locations, and Ullah and Bergin combine an agent based simulation with a dynamic landscape approach. All in all it is a very useful book.

UPCOMING CONFERENCES

Rachel S. Popelka-Filcoff, Associate Editor

2014

7-9 November. The Big Picture: Archaeology, Society and Environment Conference 2014. Plymouth UK. General information:

http://estore.plymouth.ac.uk/browse/extra_info.asp?comp_id=1&modid=2&catid=20&prodid=619

19-22 November. American Schools of Oriental Research Annual Meeting. San Diego, CA USA. General information: <http://www.asor.org/am/index.html>

1-3 December. AAA/ Australian Archaeological Association ASHA 2014 Joint Conference: Culture, Climate, Change: Archaeology in the Tropics. Cairns,

Queensland, Australia. General information:
<http://australianarchaeology.com/conferences/aaa2014-conference/>

3-7 December. American Anthropological Association 113th Annual Meeting. "Producing Anthropology" Washington DC USA. General information:
<http://www.aaanet.org/meetings/>

15-19 December. American Geophysical Union Fall Meeting, San Francisco, CA USA. General information:
<http://www.agu.org/meetings/>

7-12 December. Royal Australian Chemical Institute National Congress, Adelaide, SA Australia. Session on Chemical Analysis and Sensing in Conservation. General information: <http://www.racicongress.com/program.htm>

11-12 December. Middle Palaeolithic in the Desert II. University of Bordeaux, France. General information:
<https://sites.google.com/site/middlepalaeolithicdesert/home>.

2015

6-11 January. Society for Historical Archaeology Conference Seattle, Washington USA. General information:
http://www.sha.org/index.php/view/page/annual_meetings

8-11 January. Archaeological Institute of America Annual Meeting (AIA and SCS Joint Annual Meeting), New Orleans, LA USA. General information:
<http://www.archaeological.org/annualmeeting> Special session: "Getting Elemental: Integrating Isotopes and Archaeology" Co-organizers: Catherine M. Kearns (Cornell University) and Jeffrey F. Leon (Cornell University) Contact: archisotope@gmail.com.

8-12 March. Pittcon Conference and Expo, New Orleans, LA USA. General information: <http://www.pittcon.org/>

22-26 March. 249th National Meeting and Exposition, American Chemical Society. Denver, CO USA. General information: <http://www.acs.org>.

25-28 March. American Association of Physical Anthropologists Annual Meeting. St. Louis, MO, USA. General information: <http://physanth.org/annual-meeting>

30 March-3 April. 43rd International Conference on Computer Applications and Quantitative Methods in

Archaeology (CAA). General information:
<http://caaconference.org>

15-19 April. Society for American Archaeology. 80th Annual Meeting, San Francisco, CA USA. Abstract deadline September 2014. General information:
<http://www.saa.org/Default.aspx?TabId=1419>

21-25 April. Association of American Geographers Annual Meeting, Chicago, IL USA. Special session: New Perspectives in Paleoenvironmental Change and Geoarchaeology:
Matt Peros (mperos@ubishops.ca), Tim Beach (beacht@austin.utexas.edu), Sam Munoz (semunoz@wisc.edu).
General information: <http://www.aag.org>

27-30 April. GMPCA congress – Archeometry 2015. Besançon, France. Abstract deadline 30 October 2014
General information: <http://chrono-environnement.univ-fcomte.fr/spip.php?article1967>

27-30 April. TECHNART 2015 Conference on "Non-Destructive And Microanalytical Techniques In Art And Cultural Heritage" Catania, Italy Abstracts due 16 January 2015/ General information:
<http://technart2015.lns.infn.it/>

3-7 May AGU-CGU-GAC-MAC Joint Assembly. Montreal, Canada. General information:
<http://ja.agu.org/2015>

18 – 22 May. ASMOSIA XI International Conference: Association for the Study of Marble & Other Stones in Antiquity Split, Croatia. Abstract deadline: December 15th, 2014. General information:
<http://asmosiaxi.wix.com/split>

29-20 May "Communities, Landscapes, and Interaction in Neolithic Greece". IGEAN – Innovative Geophysical Approaches for the Study of Early Agricultural Villages of Neolithic Thessaly, Rethymno, Crete. General information: <http://igean.ims.forth.gr/conference>.

23-26 June. 8th International Workshop for African Archaeobotany. Modena, Italy.
General information:
<http://www.palinopaleobot.unimore.it/site/home/8th-international-workshop-for-african-archaeobotany-iwaa.html>

5-10 July. Eighth Lapita Conference. Port Vila, Vanuatu. General information:
<http://chl.anu.edu.au/departments/archaeology/lapita8/>

July 27 - August 2 INQUA 2015 Congress to be held in Nagoya, Japan Abstract deadline December 20, 2014
Special sessions: "Integrating Holocene Climate And Environmental Records From The High Southern Latitudes", "Human adaptation to tropical and subtropical desert environments in the Late Pleistocene and Holocene", "The Legacy Of Mountain Glaciation".
General information: <http://www.inqua2015.jp>.

16-21 August. Goldschmidt Conference, Prague Czech Republic. General information:
<http://goldschmidt.info/2015/>

New Zealand Archaeological Association Conference, Bay of Islands New Zealand. General information:
<http://nzarchaeology.org/cms/index.php/conferences>

17-20 August. Canadian Quaternary Association Bi-annual Meeting. St. John's, Newfoundland and Labrador, Canada. More information TBD

7th-9th September. Glass Reflections, "Glass in the Year of Light". Cambridge, UK
General information: <http://www.glassreflections.sgt.org>

8-10 September. International Symposium on Knappable Materials 2015. Barcelona, Spain. Abstract deadline: February 2015. General information:
<http://www.ub.edu/cherts-symp2015/>

Sept 27-Oct 2, 2015. SciX Conference 2015. Providence, RI, USA. General information:
<http://www.scixconference.org>

11-12 December. Middle Palaeolithic in the Desert II. Bordeaux, France. General information:
<https://sites.google.com/site/middlepalaeolithicdesert/home>

2016

Spring 2016. International Symposium on Archaeometry (ISA), Kalamata, Greece.
<http://www.ims.demokritos.gr/ISA/>

29 August-2 September. World Archaeological Congress, Kyoto, Japan.
<http://www.worldarchaeologicalcongress.org/>

Cotsen Institute of Archaeology
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SAS BULLETIN

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